American Journal of Public Health

VOLUME XVII OCTOBER, 1927 NUMBER 10

EVIDENCE CONCERNING THE REPUTED HEALTH VALUE OF FATS

A Review of the Literature

JOHN W. M. BUNKER, PH.D.

Associate Professor of Biochemistry and Physiology, Massachusetts Institute of Technology, Cambridge, Mass.

THE truth seems to be that the common edible fats, whether of animal or vegetable origin, have no *constant* vitamin value. Some are usually low or lacking in vitaminic activity, and the best are variable in this respect. Until some criterion other than taste, appearance, or reputation can be devised for judging the nutritional value of fats as purchased, we must assume them to be unreliable sources of vitamins and dependable only for their universally high calorific value.

SINCE THE DISCOVERY of the important fat soluble vitamins, increasing attention and emphasis have been paid to the matter of fats in the diet. That the discovery of the presence of fat soluble vitamins should be linked with butter fat might be considered to have been a matter of chance. It is inevitable, however, that since this discovery was made in connection with this substance, much attention should have been paid to butter fat as an ingredient of the diet.

"It is questionable whether its vitamin content would now attract the attention that it does if it were not for the fact that butter fat was the material in which the vitamin was first discovered." [44]

The measures taken by your food administration during the war to conserve our natural resources of fats, gave added importance in the minds of dietitians to this part of the diet. The report, widely quoted, that the population of Germany during the war suffered from a lack of fats, has also had its effect in shaping opinion.

Our own Department of Agriculture in a bulletin issued in 1922 [1] emphasized the importance of an abundant supplay of fats during peace times as well as during war. Among the voluminous reports from laboratory workers who have investigated the vitamin question are many which deal with the vitamin content of edible fats of various kinds. All of these factors have combined to focus the attention of nutrition students upon this particular foodstuff.

It seems to the writer that the ideas concerning the part played by fats in the diet might profitably be reviewed with the hope that a compilation of our present store of evidence concerning the subject will be useful to nutrition workers in particular, and to all who are interested in health in general.

ARE FATS NECESSARY?

The assumption that fat is a necessary element in the well balanced diet, will bear careful analysis. The amount of fat included in the diet of an individual will undoubtedly vary considerably according to the appetite of that individual for fatty flavors. The relation of the fat content to the savor of cooked meats is a matter of common knowledge. The influence of fats upon the cooking of breads and cakes is a recognized factor. It is also an admitted physiological fact that those things which increase the flavor and attractiveness of foods are an indirect aid in the digestive processes.

The student of nutrition is commonly told that fat is a most economical foodstuff. This statement is subject to certain qualifications. Most of our foods contain substances other than those which are calorific. The major diluent is water and secondarily in the case of plant foods, non-digestible fiber. Fats, on the other hand, do not combine with water, carry very little of it in emulsion, and are not generally associated with any considerable amount of indigestible fiber. Fats, therefore, are undoubtedly, from a calorific standpoint, concentrated food substances. Because of their chemical structure they yield to the body, gram for gram, more than twice as many calories as do proteins or carbohydrates. It is also true, however, that fats do not yield their energy to body metabolism so quickly and completely as do carbohydrates. Being concentrated foods, fats are undoubtedly highly desirable and economical when one considers the subject of storage or transport.

From a pecuniary standpoint, a food is economical if it yields a large return in nutritional value for the money spent. The calorie cost of protein is generally more than the calorie cost of fats, but, on the other hand, the calorie cost of cereal products, which are largely carbohydrate, is less than that of edible fat. Fats, then, are the most economical foodstuffs only if they contribute something which other foodstuffs of less cost do not provide.

It appears that the only thing provided by fats, which cannot be provided by proteins or carbohydrates, aside from flavor and influence upon the palatability of foods, is the content of vitamins which the fats may or may not supply. All fats are not equally rich in vitamin content. A given kind of fat varies under different conditions in its vitamin content. This variability of edible fats and oils in the matter of vitamin content it perhaps not so widely recognized as it should be.

RÔLE OF FATS IN NUTRITION

Postponing the discussion of vitamins in fats, let us consider briefly the rôle of fats in nutrition. A certain degree of body fat is undoubtedly an asset to health. It may be laid down in the body as a result of feeding fats and oils, but such is not necessarily the case. Much of the dietary intake of fats is converted into heat or to other forms of metabolic energy. Likewise there is no doubt that body fat may be formed from an excess of carbohydrate or protein in the diet over and above the energy requirement.[2] Is it possible that fat may be dispensed with entirely in the diet?

NUTRITION WITHOUT FATS

Von Groer[3] in 1919 reported carrying two infants during their first half year of life on a practically fat free diet, consisting at one time of separated milk and sugar and later of porridge with skimmed milk and sugar. The children grew at practically normal rate without symptom of disease but there was some indication of lowered nutritive condition. Apparently no serious attempt was made to supply the lack of fat soluble vitamins of such a diet. Hess (1920)[4] reports a study in which five infants, varying in age from 5 to 12 months, were fed successfully for 8 and 9 months on a diet consisting of skimmed milk, cane sugar, autolysed yeast, orange juice, cotton seed oil and cereal.

Hindhede[5] reported that young men were kept on a diet for 15 months consisting of bread and vegetables without the addition of fat and that they retained health and vigor. In 1920 Drummond[6] reported raising young white rats on a diet containing a source of vitamins which showed only the merest trace of neutral fat. They remained in good health and showed considerable growth, but the growth was reported as subnormal. It appears that while vitamin A was supplied in this diet some of the other vitamins may have been lacking. Drummond and Coward (1921)[7] report that young rats grown to maturity on diets without fats have shown normal development and behavior. Osborne and Mendel (1920)[8] report that rats could be maintained in excellent nutritive condition over considerable periods of time on diets practically free from fats, provided they were supplied with adequate amounts of the vitamin A (cf. Drummond[9]).

Hindhede, Drummond, Coward, McCollum and others have stated their views essentially in similar language, that edible fats from a physiological standpoint are not essential to the diet, provided a sufficient amount of vitamins, such as are commonly expected to be associated with natural fats, be supplied in the other foodstuffs. Richardson (1921)[10] stated his belief, that with a varied diet it makes no difference whether oleomargarine or butter or, in fact, any dairy product is consumed. To quote from his paper:

> If rats . . . are fed a mixed ration of moderate variety, consisting of the food commonly used on the ordinary table—meat, vegetables, grains, and fruits, but without milk or dairy products, they get along very well indeed without developing dietary or deficiency diseases, showing normal growth and health, except for an occasional ailment or infection to which laboratory animals are always subject. Such rats reproduce unto the *nth* generation in spite of the absence of their per diem of milk.

From such widely varied scientific evidence, we may assume that fat as such is not indispensable to the diet. It becomes proper, then, to consider what else it may contribute to the well-being to the consumer, other than the benefits conferred by its favorable effect upon flavor and texture of food. This brings us to the question of the vitamin content of fats.

VITAMIN VARIABILITY IN BUTTER AND MILK

The discovery by McCollum and Davis in 1913[11] and in the same year by Osborne and Mendel[12] of the presence of accessory food factors in the fat fraction of milk, focused attention upon the vitaminic properties of butter. "The fact that it was first detected in butter fat and that this is a well-known and convenient source has led to what is perhaps over emphasis upon the value of this foodstuff."[13]

Steenbock, Boutwell and Kent (1918)[14] call attention to the wide variation in vitamin content of different butters. They offered the surmise that possibly the rations on which the butter fat had been produced were responsible for these variations. They pointed out likewise that conditions of storage and handling of butter also will bring about changes in the initial content of vitamin in this substance.

Steenbock (1920),[16] citing the work of Drummond[10] states that the thermostability of vitamin A in butter is not very great. (It should be remembered that, at this time, vitamin A and vitamin D had not been clearly distinguished.) Hopkins also was disturbed by the discrepancy between his results[17] and those reported by other investigators, and ventured the suggestion that a seasonal variation in the food value of the milk might be the cause. Hess, Unger *et al.*[18] in the same year pointed out that the diet of the cow is a most important factor in determining the antiscorbutic vitamin value of the milk produced.

Drummond and Coward (1920)[19] state:

> There is no hard and fast line between the animal fats and the vegetable fats when their value as the source of vitamin A is considered. The amount of vitamin A in vegetable oils de-

pends upon the tissue from which it is prepared and the method of preparation and refinement. The amount of vitamin present in an animal oil is dependent primarily upon the diet of the animal.

Hughes (1921)[20] reported that milk from cows fed during a year on a diet low in three vitamins showed no difference, in respect to antiscorbutic properties, from milk of cows on an adequate diet, but that the milk from the low vitamin diet group was low in fat soluble vitamins.

Dutcher[21] stated that vitamins in foods are directly or indirectly of plant origin. The vitamin content of foods such as milk depends upon the vitamin content of the ration of the animal furnishing the milk. Drummond, again,[22] in the same year states the diet of the cow to be the chief cause of variations of the amount of vitamin A in the milk. Butter is stated to be less potent as a source of A than the same amount of fat in the original milk. The loss is probably due to destruction in handling.

Appleton[23] reports on the diet of the inhabitants of Labrador being more completely supplied with fat vitamins from condensed and evaporated milks than from the butter there available. He states that this butter was made from milk from cows fed on poor hay. Kennedy and Dutcher (1922)[24] report similar results from feeding cows upon diets high or low in vitamin content. Drummond *et al.* (1923)[25] reported that the feeding of vitamin-rich cod liver oil to cows in quite large doses increased the vitamin content of their milk. He reported also that the vitamin content of winter milk was lower than that of summer milk. Sopp (1924)[26] reports that milk in the springtime contains less of vitamin A than does milk in other seasons, most likely owing to the feeding conditions prevailing. As soon as winter feeding (in Norway) gives way to pasture feeding the vitamin content of the milk of the cows begins to increase. Drummond *et al.* (1924)[27] report further experiments to support the relationship between the presence of vitamin A in the diet of the cow and its presence in the milk fat.

Luce (1924)[28] reports the first of a series of papers which demonstrate that vitamin A in milk is affected by diet of the cow while vitamin D is affected both by diet and by sunlight. Powell (1925)[29] reporting on the vitamin D content of milk, states that a child with active rickets receiving a pint of winter milk a day for one month showed no improvement, while two other children also suffering from rickets, received each a pint of milk a day after it had been exposed to ultra-violet radiation from a mercury vapor lamp for 20 minutes. These two showed intense improvement. This constitutes evidence that some milk is lacking in vitamin D, and since this vitamin, associated with A, is in the fat part of milk there must be a corresponding variability of D in butter.

Golding (1925)[30] reports again the favorable effect of the diet of the cow upon the vitamin content of butter made from her milk. Ramboin and Simonnet (1926)[31] report in confirmation on the effects of light and diet on the biological value of milk. Chick and Roscoe[32] report that the value of the milk in vitamin A is entirely dependent upon the diet of the cow. With regard to vitamin D the degree of exposure of the cow to sunshine is all-important. Milk contains a maximum amount of vitamins A and D when the cow is out at pasture in the summer.

VITAMINS IN FATS OTHER THAN BUTTER

The early recognition of the variability of the vitamin content of butter was undoubtedly one factor which led investigators to look into the vitamin content of other natural edible fats. Investigations have been made as to the content of fat soluble vitamins in the fat of beef and pork; of the prepared cooking fats, such as lard and the hydrogenated vegetable oils; of the various butter substitutes, which in this country must be called "oleomargarine," and into the constituents of these margarines.

Some of the earlier investigations re-

sulted in conclusions which cannot be accepted because of the failure at this time to recognize the necessity of supplying, in experimental diets used in testing these substances, a sufficient amount of the necessary vitamins other than those which were being sought. The work of Funk and Macallum (1915–16)[33] and the contemporaneous experiments of Osborne and Mendel[34] and others seem to indicate that lard lacks fat soluble vitamins in any considerable amount, even though the lard be prepared in the laboratory with as little application of heat in its processing as is possible. When one stops to consider the diet of the hog one can see why this is to be expected. The diet of the hog does not contain the leafy products which are the original supply of vitamin A in animal fats.

Halliburton and Drummond reported (1917)[35] that white rats would grow at a slow rate for a short time on a diet in which the only source of fat soluble vitamins was lard, but that to save the life of the animals the addition of some other source of fat soluble accessory substances was necessary. Daniels and Loughlin (1920)[36] have been widely quoted in their report that rats fed on a ration from which all of this fat soluble vitamin had apparently been removed except that which was in the lard, "grew normally, reproduced, and reared young." As these authors frankly state, their results are out of harmony with the published results of other workers, and if there was no error in their experiment, the conclusion to be drawn must be that some samples of lard may contain some amount of fat soluble vitamins.

Halliburton and Drummond[35] reported a series of experiments to show that the lower melting point fraction of beef fat, which we designate as oleo oil, contains appreciable amounts of fat soluble vitamin, thus confirming previous work of Osborne and Mendel that a sample of oleomargarine tested by them was found to be equal to butter fat in the nutrition of young rats.

Samples of margarines prepared from vegetable oils were tried in a similar way. The animals did not present the well nourished appearance exhibited by those fed on butter or upon oleomargarine, but in no case did eye trouble occur. The authors conclude that it is possible that small traces of the accessory substances were present in the vegetable margarines, but in not sufficient amounts to maintain a good rate of growth and health. On replacing the vegetable oil margarines with oleo oil margarine the rate of growth was improved in each case. In a similar set of experiments by the same authors it appeared that cocoanut oil, peanut oil and hydrogenated cotton seed oil are deficient in the accessory substances. McCollum[36a] also found oleomargarine to be satisfactory in growth promoting qualities; likewise Osborne and Mendel.[36b]

These early evaluations of the vitamin content of butter, of lard and of margarines were started before it became clearly recognized that vitamin D, the antirachitic vitamin, is, while associated with vitamin A, the growth promoting vitamins a distinct substance, and that the one may occur without the other. Drummond (1921)[37] investigating the nutritive value of lard and lard substitutes from the standpoint of vitamins, was able to shed light upon the differences reported as to the vitamin content of lard. In his work young pigs were brought up on diets, some of which were practically devoid of vitamin A while others were supplied with an ample amount of this substance.[38] After several months on the various diets, certain animals from each lot were slaughtered and samples of the leaf fat (from which the best lard is prepared), were taken. These were tested for the presence of vitamin A with the result that it was found that the leaf fat of swine fed on diets adequate in vitamin A contained that substance (thus the result of Daniels and Loughlin[36]) but that its presence could not be demonstrated in the fats derived from those animals which were fed on diets deficient in fat soluble

vitamins (thus the results of Halliburton, Osborne *et al.*[34, 35]). Drummond showed that it is possible to prepare lard from the leaf fat of hogs which have been fed upon a suitable diet, and to obtain in that lard vitamin A, but that an active sample of hog fat after being converted to lard by the rendering process commonly used in manufacture, employing high temperatures and aeration lost its potency. It appears then that until, or unless the manufacturers of lard revise their process of preparation, no lard can be expected to supply any significant quantity of fat soluble vitamins. Even if the manufacturers were to change their process of preparing lard we could then be sure of no significant or constant quantity of vitamins in this substance unless adequate attention were given to the diet of the hogs from which the lard is to be prepared. It does not seem likely that at this time such attention to the preparation of lard is likely to be given. One may conclude safely, therefore, that lard, although an edible fat important in cooking, is an insignificant and negligible source of vitamin in the diet.

Butter substitutes have come into prominence of late years. These are all branded in the United States by law as oleomargarines. In the case of many of the butter substitutes which are prepared from vegetable oils, this is a scientific misbranding, although it is legal. The term, "oleomargarine," refers to a mixture of fats emulsified to give a suitable texture, containing at least some portion of oleo oil, the low melting point fraction of beef fat. Because of the nature of the diet of the beef animal its body fat may be expected to contain some fat soluble vitamins A and D. Experimental evidence already presented beside other experiments which are not here detailed support this theory.

The vegetable oils in general have been found to be lacking or low in vitamin content. McCollum and coworkers[39, 40] found that olive oil, corn oil, bleached cottonseed oil, and linseed oil were deficient in growth promoting properties. Osborne and Mendel[41] reported almond oil to be lacking. Halliburton and Drummond[33] corroborate these general findings. Hess and Weinstock[66] found that vegetable oils can acquire antirachitic potency through irradiation, and Steenbock[67] reported the same. McCollum[68] and Mellanby[69] each reported antirachitic properties in cocoanut oil, which Steenbock suggests may have been from dried copra,[67] but Bills[70] found edible white cocoanut oil to be lacking in D.

It is expected that margarines prepared from these vegetable oils will show equal variations in their fat soluble vitamin content. Ordinarily the only reliable vitamin content of margarines of this type will be that imparted by the milk in which they are churned and by the relatively small amount of butter incorporated in them in manufacture. In the oleomargarines likewise there must be expected a variation in the vitamin power of the oleo oil used since this oil must vary in this respect as does the fat appearing in milk, for the same reasons.

In the case of oleo oil margarines, the effect of processing and rendering the oil may affect adversely the original content of the fat. Vitamins of the fat soluble class are rather resistant to heat but are weakened by oxidation (Drummond and Coward (1920)[42]).

Aeration is sometimes employed to deodorize fats, especially in the preparation of "neutral" lard and certain hydrogenated vegetable oils. Such treatment is incompatible with the retention of vitamin strength.

Storage is another factor affecting the stability of vitamins in animal or vegetable fats. Brief storage at high temperatures will accelerate the loss of vitamin potency more intensively than longer storage at lower temperature. Osborne and Mendel[43] found that samples of butter fat and butter oil lost some strength on storage; the oil was inactivated after

one year. Dutcher[21] reports the loss of vitaminic activity of various foods incident to storage.

Although vegetable fats and oils such as are used in the preparation of so-called "nut margarines" are likely to be deficient in fat soluble vitamins, some samples show considerable potency. Drummond and Coward[19] state that no hard and fast line can be drawn between these two classes of fats as regards their fat soluble vitamin value. They found that certain vegetable oils, if unrefined, are good sources of the vitamin A, but that both animal and vegetable oils tend to lose this vitamin upon refining. Steenbock *et al.*[44] report that vitamin A was greatest in those natural animal fats which had the most yellow color.

Early work by Drummond[45] has led to the expectation that there might be an association between fat soluble vitamins and the carotinoids or yellow pigments of vegetable and animal tissues. Later Drummond abandoned the idea, and Palmer[46] has assailed vigorously the idea of such association being anything in the nature of a causative relation.

PROPORTION OF FATS IN DIETS

The prevailing enthusiasm for butter fat as a source of vitamin in the human dietary does not always take into account the proportions of fats to total diets used in the early experiments which gave to butter fat its reputation in this regard. Osborne and Mendel used in their early experiments butter to the extent of 18 per cent by weight of the ration or approximately 28 per cent of the total calories.[12] On the same basis, a man consuming 3,000 calories per day would require an amount of butter in the neighborhood of one-quarter pound. Funk and Macallum[33] used butter to the extent of 50 per cent of the total calories. Halliburton and Drummond[35] supplied 35 per cent of the total calories with fat in order to obtain the necessary fat soluble vitamins. McCollum and Davis used butter oil, prepared from an alcoholic solution of melted butter fat, separated by fractional crystallization and concentrated under vacuo to the extent of 15 per cent of the total calorie value.

To conclude, therefore, that butter alone will supply the necessary fat soluble vitamins in the diet is evidence of loose thinking and lack of analysis of existing data. If one could be sure of obtaining butter as rich in fat soluble vitamins as the best samples tested, and if the ratio of vitamin requirement is the same for human beings as for white rats one may presume that butter or equivalent oleo oil margarine might be made to supply the daily vitamin requirements of an individual. The danger of even so precariously supported an assumption lies in the extreme variability of the vitamin content of butter and of butter substitutes, even those of the oleo oil type. One cannot rely upon what he spreads upon his bread to supply his necessities in fat soluble vitamins. These must be secured or supplemented from other sources, as has repeatedly been stated by those who are students of the subject.

The antirachitic vitamin, D, is also subject to great variations in its distribution in animal and vegetable fats. Cod liver oil has come to be used as a source of this vitamin,[47] and it can now be obtained with tested standardized vitamin A content.[48] No such standardization of other fats has as yet been attempted so far as we are aware.

Vitamin E is the most recently christened of the group.[58] This vitamin has an effect upon fertility and ability of the mother to nurse her young.[59] Evans *et al.*[59] found that this vitamin is present in the tissues of animals fed on natural food and is probably present in most commercial and hydrogenated edible oils. Sure[63, 60] found that commercial cocoanut oil, linseed, and sesame oils do not produce fertility; common olive oil, and directly expressed peanut oil produce fertility but fail in lactation; commercial cottonseed oil produces fertility and partially permits lactation; while extracted wheat

germ oil, hemp seed, and yellow corn oil permit rearing and lactating of young. Palm oil was also found to exhibit anti-sterility properties.[61] Mattill and Clayton[62] report that if the diet is low in fat, low levels of butter fat provide adequate vitamin E for continuous fertility. They report also that radiation with ultra-violet light does not compensate for lack of E. The knowledge of this vitamin is in 1927 still in a state of flux, and final conclusions about it are hardly warranted.

DISCUSSION

The modern pediatrician no longer relies upon milk fat to supply fat soluble vitamins to the baby upon a modified milk diet; he prescribes cod liver oil. Many persons think of milk and butter as the "perfect food." They should realize that modern investigations have shown that "strange as it seems, milk and butter both are unable to protect a young animal from rickets, while cod liver oil possesses these properties to a marked degree" (Funk[64]). The public health worker and the dietitian might well join with the baby specialist in thus applying the scientific evidence in regard to these matters. Those who have worked long with the testing of foods for vitamin properties seem to be of one mind in this regard; thus McCollum and Simmonds in a recent book[49] expressed the opinion that given a sufficiently varied diet, containing fruit, vegetables, whole milk and the ordinary elements which we know to be essential, it matters not what one uses to spread upon his bread. We might add that it matters just as little what he uses to shorten his biscuits and cakes, or to fry his chicken and potatoes. In fact, given a diet which is widely varied, including fruit and vegetables in adequate amounts, it would appear that the fat content of the diet need be given no consideration whatsoever beyond the dictates of appetite and choice of flavor.

To conclude for such reasons that fat has no place in the diet would be unwarranted. Although fat is dispensable from the diet, and although the emphasis often laid upon butter and milk as certain sources of vitamins is a mistaken emphasis, nevertheless fats are useful foodstuffs. As part of our natural resources they should be used wisely. Their use should be mainly upon a calorie basis, with a wise allowance for their possible vitamin value. This vitamin value must not be over-estimated.

The public is entitled to the truth, and the truth seems to be that the common edible fats, whether of animal or vegetable origin, have no *constant* vitamin value. Some such fats are usually low or lacking in vitamins, and the best are variable in this respect. Appearance and taste are no guide in the matter, and reputation is not always well deserved. Until some other criteria than these can be devised for judging the nutritional value of our edible fats as purchasable on the open market, we must for safety assume they are unreliable in vitamin value and look to other foods to supplement the supply.

Beef fat excreted in the milk of the cow is no different in its origin from beef fat which is retained within the animal although the chemistry of butter fat and oil differ somewhat. Each is a suitable food. The vegetable oils also, such as olive oil, palm oil, cocoanut oil, peanut oil, cottonseed oil and others are all suitable foodstuffs. The digestibility of the various animal and vegetable fats is high.[1, 50, 51, 52, 53, 54]

Whether one shall use lard or hardened cottonseed oil, butter or oleomargarine seems to be entirely a matter of taste and economy. All of these are clean foods. Margarines are prepared in government licensed plants under federal inspection and regulation, from materials which are pasteurized or sterilized. Cooking fats in general are rendered or processed at high temperatures and dispensed into final containers in melted state, thus insuring freedom from contamination through handling.[55]

CONCLUSIONS

Fats have a place in the diet and must be regarded as aids in maintaining health through the diet. As foodstuffs economical for purposes of transportation and handling they recommend themselves highly. As adjunct to the daily dietary requirements in supplying desirable flavors and texture to food they play some beneficial rôle in assisting the physiology of digestion, but we must not place upon them a value which they do not deserve. Trust without justification is unwise.

The early expectations concerning the vitamin content of animal and vegetable fats, based upon the original vitamin research in this field, have not been warranted in the light of more mature investigation. There has been a widespread tendency in writing about nutritional subjects to over-emphasize the vitamin side of the matter. The case is succinctly stated in a bulletin of the New Hampshire Board of Health[56]: "It needs to be understood, not only that man has been eating vitamins ever since the days of Adam . . . but also that in every normal individual, as well as in animals, there is implanted an instinct which causes an involuntary selection of these needed foods, provided they are available. Thus the craving on the part of every normal person for fruits, vegetables and green foods is natural and is one which should be heeded." Eddy stated in this journal in 1926: "Foods may be complete or incomplete in their ability to meet human requirements and it is the part of wisdom to learn to combine enough of the incomplete forms to meet human requirements and at the same time maintain variety in diet. This view of the food problem is gradually replacing the limited vision of those faddists whose sole aim seems to be to classify foods into good or bad categories." McCollum has cautioned against the over-emphasis of the importance of vitamins as a problem in practical nutrition, feeling that "they form a problem only of about equal importance with certain others, especially the quality of proteins and the proper adjustment of mineral salts."[57]

There is a laudable tendency in education to pass on to others the latest discoveries in the various branches of learning. It is thus that we keep up with the progress of the times. Occasionally the first flush of enthusiasm over new discoveries leads us into unwarranted expectations. It may be that some such phenomenon has been going on in regard to our attitude toward fats in the diet and their value as carriers of vitamins. In the light of the scientific facts, which have been adduced, it would seem to be indicated that such enthusiasm should be tempered with reason.

BIBLIOGRAPHY

1. *U. S. Agr. Bull. 1033* (July), 1922.
2. Sherman. *Chemistry of Food and Nutrition*, 1926.
3. Van Groer. *Biochem. Ztschr.*, 97, 1919.
4. Hess. *J. Biol. Chem.*, 41, 1920.
5. Hindhede. *Molkerei Ztg.*, 28, 1918.
6. Drummond. *Proc. Physiol. Soc.*, 1920.
7. Drummond and Coward. *Lancet*, 1921.
8. Osborne and Mendel. *J. Biol. Chem.*, 45, 1920.
9. Drummond. *Biochem. J.*, 15, 1919.
10. Richardson. *Am. Food J.*, July, 1921.
11. McCollum and Davis. *J. Biol. Chem.*, 15, 1913, p. 167.
12. Osborne and Mendel. *Ibid.*, 15, 1913, p. 311.
13. Ellis and McCleod. *Vital Factors of Food*, 1922.
14. Steenbock, Boutwell and Kent. *J. Biol. Chem.*, 35, 1918.
15. Steenbock. *J. Biol. Chem.*, 41, 1920.
16. Drummond. *Biochem. J.*, 13, 1919.
17. Hopkins. *Biochem. J.*, 14, 1920.
18. Hess, Unger, *et al. J. Biol. Chem.*, 45, 1920.
19. Drummond and Coward. *Biochem. J.*, 14, 1920.
20. Hughes. *J. Biol. Chem.*, 46, 1921.
21. Dutcher. *J. Indust. Engin. Chem.*, 15, 1921.
22. Drummond. *Biochem. J.*, 15, 1921.
23. Appleton. *A. J. P. H.*, 11, 1921.
24. Kennedy and Dutcher. *J. Biol. Chem.*, 50, 1922.
25. Drummond, *et al. J. Agr. Sci.*, 15, 1923.
26. Sopp. *Norsk. Mag. f. Laegevidensk.*, 22, 1924.
27. Drummond, *et al. J. Agri. Sci.*, 14, 1924.
28. Luce. *Biochem. J.*, 18, 1924.
29. Powell. *Brit. M. J.*, 1925.
30. Golding. *Agr. Prog.*, 2, 1925.
31. Ramboin and Simonnet. *Bull. Soc. Hyg. Aliment.*, 14, 1926.
32. Chick and Roscoe. *Biochem. J.*, 20, 1926.
33. Funk and Macallum. *Ztschr. f. Physiol. Chem.*, 92, 1914; *J. Biol. Chem.*, 23, 1915; *ibid.*, 27, 1916.
34. Osborne and Mendel. *J. Biol. Chem.*, 15, 1913; *ibid.*, 16, 1913–14; *ibid.*, 17, 1914.
35. Halliburton and Drummond. *J. Physiol.*, 51, 1917.
36. Daniels and Loughlin. *J. Biol. Chem.*, 42, 1920.
36a. McCollum. *J. A. M. A.*, 68, 1917.
36b. Osborne and Mendel. *J. Biol. Chem.*, 20, 1915.
37. Drummond. *J. Soc. Chem. Ind.*, 1921.
38. For diets used cf. Drummond, *et al.*, *Biochem J.*, 14, 1920, p. 742.
39. McCollum, *et al. J. Biol. Chem.*, 15, 1913, p. 167.
40. McCollum, *et al. Am. J. Physiol.*, 41, 1916.
41. Osborne and Mendel. *J. Biol. Chem.*, 17, 1914, p. 401.

42. Drummond and Coward. *Biochem. J.*, 14, 1920 (second paper).
43. Osborne and Mendel. *J. Biol. Chem.*, 24, 1915.
44. Steenbock, *et al. J. Biol. Chem.*, 47, 1921.
45. Drummond. *Lancet*, 1920.
46. Palmer. *Science*, 50, 1919 *et seq.*
47. McCollum *et al. Proc. Soc. Exper. Biol. & Med.*, 18, 1921.
48. Twenty-two papers by A. D. Holmes, cf. *Boston M. & S. J.*, 195, 1926.
49. McCollum and Simmonds. *Food Nutrition and Health*, 1926.
50. Rockwood and Swickes. *J. A. M. A.*, 71, 1918.
51. Picquard. *Am. Food J.*, 1918.
52. Lundgren, *et al.* Cf. *Chem. Abstr.*, 16, 1922.
53. Holmes. *J. Oil and Fat Ind.*, 15, 1926.
54. Holmes. *Boston M. & S. J.*, 192, 1925.
55. Edible Oils and Fats. *Bull. 8*, Series X, Quartermasters Corps Subs. Sch. U. S. Army.
56. *Bull. N. H. State Bd. Health*, June, 1922.
57. McCollum. *Hoard's Dairyman*, Dec., 1921.
58. Sure. *J. Biol. Chem.*, 58, 1924.
59. Evans, *et al. Proc. Natl. Acad. Sci.*, 11, 1925.
60. Sure. *J. Biol. Chem.*, 62, 1924.
61. Sure. *J. Biol. Chem.*, 69, 1926.
62. Mattill and Clayton. *J. Biol. Chem.*, 68, 1926.
63. Sure. *Proc. Am. Soc. Biol. Chem.*, in *J. Biol. Chem.*, 63, 1925.
64. Funk. *Chemical Age* (N. Y.), 30, 1922.
65. Hopkins. *J. Metabolic Res.*, 1, 1922.
66. Hess and Weinstock. *Proc. Am. Pediat. Soc.*, June, 1925.
67. Steenbock. *J. Biol. Chem.*, 64, 1925.
68. McCollum. *J. Biol. Chem.*, 53, 1922.
69. Mellanby. *Lancet*, 1919 i.
70. Bills. *J. Biol. Chem.*, 72, 1927.

MASSACHUSETTS EXPERIMENT IN MENTAL HYGIENE

MASSACHUSETTS has launched an important public health experiment—the use of the state hospital as a research unit.

In his presidential address at the eighty-third Annual Meeting of the American Psychiatric Association recently held at Cincinnati, Dr. George M. Kline, Commissioner of Mental Diseases of Massachusetts, discussed this public health innovation.

In part Dr. Kline said: "No state hospital system can adequately or conscientiously fulfil its duty to the public and to suffering humanity without giving considerable thought to the question of research. Without the research spirit and without the development of an adequate machinery for research we can only make progress by intuition or by guess-work. The centralization of the state hospitals is not only of prime value to administration but is essential to research in our field."

Dr. Kline gave three reasons to support his statement that the state is the logical unit to undertake research of this sort, namely, (1) statistically, the effects of emigration and immigration are greatly minimized because of the large population found in a state; (2) in most states, systems of vital statistics have been developed which can be utilized in the studies under way; (3) a larger amount of disease and disorder affecting the human population is under observation, treatment and control in the state hospitals than in any other type of disease whether mental or physical.

Because the majority of persons seriously ill with mental disease are under observation and control in state hospitals, the state hospital system, well centralized, offers a wonderful opportunity for studies of morbidity in the field of mental disease, and which is far superior to that afforded in other fields of medicine.

"In my opinion," said Dr. Kline, "an analysis of the mass data which a centralized state system economically makes available, will result in scientific information of equal, if not greater, value as has already been contributed by studies of individual cases."

Putting into effect the suggestions made in his address Dr. Kline has already begun to organize a system for using the state hospitals as research units. He has delegated to Dr. Neil A. Dayton, Director of the Division of Mental Deficiency, the work of developing a new statistical system. Under Dr. Dayton's direction a statistical analysis will be made with the purpose of bringing about the greatest development throughout the State of Massachusetts of research in psychiatry and mental deficiency.

THE WILD RAT AS A CARRIER OF ORGANISMS OF THE PARATYPHOID-ENTERITIDIS GROUP

ELIZABETH VERDER

Department of Hygiene and Bacteriology of the University of Chicago, Chicago, Ill.

SPONTANEOUS infections among laboratory rats due to organisms of the paratyphoid-enteritidis group are not uncommon.[1] It is important to determine the frequency of occurrence and local distribution of this group in wild rats because of the association of the organisms with food poisoning outbreaks. Savage and Read[2] report the isolation of true Gaertner bacilli (*B. enteritidis*) from 5 out of 41 rats all of which were probably infected about a year previous with rat virus. Later Savage and White[3] isolated 6 virulent strains of *B. enteritidis* from 96 rats obtained from two slaughter houses where bacterial bait had not been used for over a year. They also found that the blood of about 30 per cent of the rats gave positive agglutination reactions with *B. enteritidis* but not with *B. aertrycke* or *B. suipestifer*. It is desirable to know the distribution of the organisms in other localities. No investigations in this country have been reported.

Since October, 1923, I have examined 114 wild rats caught in various parts of Chicago; 100 of these rats were obtained from three Chicago packing houses and 14 from a dog kennel. No rat viruses had ever been used around the packing houses; as far as I could determine none had been used in the neighborhood of the dog kennel. All rats were examined within 24 hours after death; most of them were killed in steel traps the night previous to the examination of their bodies.

Immediately after cutting through the abdominal wall the viscera were examined for disease lesions but no characteristic gross pathology marked the organs of the rats from which organisms were isolated. A small piece of the liver; one-third to one-half of the spleen, and sections, 1 cm. in length, of both the large and small intestine with their contents were removed and placed in 1 per cent dextrose broth. Brilliant green was added to the broth into which the intestinal tissue and contents were placed. After 12 to 18 hours incubation four plates of each culture were made with Endo medium. Suspected colonies were picked from the plates after 24 hours incubation into Russell's medium.

Ten organisms belonging to the paratyphoid-enteritidis group were isolated from six of the rats obtained from the packing houses. In four rats the liver and spleen were found infected with *B. enteritidis*,[4] but only the spleen of a fifth. *B. aertrycke*[4] was isolated only once; it was found in the spleen in pure culture but in no other organ examined. In no instance were the organisms isolated from the intestinal tract of the infected rats.

REFERENCES

1. Savage, W. G. *J. Hyg.*, 17:20, 1918.
   Jordan, E. O. *J. Infect. Dis.*, 36:309, 1925.
   Medical Research Council Report, No. 91, 1925.
2. Savage, W. G., and Read, W. J. *J. Hyg.*, 13: 343, 1913–1914.
3. Savage, W. G., and White, P. B. *J. Hyg.*, 21: 358, 1922–1923.
4. Jordan, E. O. *J. Infect. Dis.*, 20:457, 1917.
   Jordan, E. O., and Victorson, R. *J. Infect. Dis.*, 21:571, 1917.
   Jordan, E. O. *J. Infect. Dis.*, 22:537, 1918.
   Ibid., 33:567, 1923.

EXPENDITURES PER CAPITA FOR HEALTH WORK IN THE RURAL DISTRICTS IN OHIO

E. R. SHAFFER, M.D.

Chief, Bureau of Local Health Organization, State Department of Health, Columbus, O.

HERETOFORE, published reports of per capita expenditures for public health have been confined largely to city health districts. Figures for rural districts are more comparable.

In reporting from Ohio, 1926 was selected because it was the first year that accurate figures for expenditures were available. Per capita cost had been computed on the appropriations for public health service, which did not necessarily mean that this amount was expended and was not comparable to service rendered. The writer does not recall having read a discussion of this subject based on rural service alone. Dr. Williams of the New York State Department of Health prepared a paper on per capita expenditures in that state, based on city, township and village health service.[1]

Per capita cost of health work for rural districts is more easily computed than that of cities, inasmuch as many cities budget appropriations for various items of community endeavor not strictly public health activities; namely, garbage collection and disposal and "poor fund" budgeted with the health fund for the care of the sick poor. These activities are not pertinent to modern health service, but in many city districts are still classified as such. It is hoped that the time is not far distant in Ohio when boards of health will be divorced entirely from such responsibilities except in the form of general supervision of these activities.

It might be of interest to explain briefly the plan of health organization in Ohio in order that the reader may better interpret the per capita cost and degree of service rendered in the respective districts.

PLAN OF ORGANIZATION

The Hughes-Griswold health statute became effective in Ohio in 1920, and provides for city and general health districts. When an incorporated community (village) reaches 5,000 population it automatically becomes a city, and may be organized as a city health district.

The general health district has the county as a unit, including all villages of less than 5,000 population. Each general health district and each city health district, except those cities having a special charter form of government, has a board of health consisting of 5 members. The statute requires that the health commissioner of a general health district (county) must be a licensed physician. This provision is not mandatory for city health districts. Although this is optional for city health districts, only 17 cities of the total of 93 cities in the state employ other than physicians as health commissioners, 2 of whom are public health nurses.

There are 93 cities and 88 counties in Ohio, of which 86 counties have organized health service. Two counties are not provided with health organizations owing to the extreme financial shortage and partial exhaustion of the natural resources which decrease the source of official financial income in form of taxes. What little public health service these 2 districts receive is provided by the State

Department of Health. The policy of the State Director of Health in the past has been to endeavor to raise the standard of thought and education to the stage where an organization can be secured, rather than take advantage of provisions of the statute whereby an organization may be set up arbitrarily. There are prospects for securing an organization on a part-time service basis during 1927 in each of these delinquent counties.

The numerical status of whole-time official public health service in Ohio as of February 1, 1927, is as follows:

Whole-time Rural Districts	47
Whole-time City Districts	17
Whole-time City Districts combined with County Districts	16
Total	80

BASIS ON WHICH RATE IS FIGURED (PER CAPITA)

In each case the figure given in the per capita expenditure is based on the U. S. Bureau of Census estimated population for 1926, and represents the amount spent from public funds for salaries of district health commissioner, of public health nurses, clerical service and such other items as traveling expenses and maintenance of the department of health. These figures do not include expenditures of voluntary agencies for public health, but do include subsidy paid to local health districts from state funds by the State Department of Health in the form of reimbursement to the extent of one-half the amount paid for health commissioner, one public health nurse and a clerk. The maximum amount paid to any one health district is $2,000, or $1,000 each 6 months. The biennial appropriation in the past for this purpose has been $500,000.00.

AVERAGE RATE FOR THE STATE

The total estimated population for the 80 districts (*i.e.*, excluding the two counties not organized) is 2,320,698 with a total expenditure of $666,040.32, giving a per capita rate of expenditure of 28¾ cents. The highest individual county rate is 62 cents with a population of 42,309 and an expenditure of $26,179.46. The value of real and personal property in this district according to 1910 appraisement is $97,729,990.00. Reappraisement in all counties in Ohio was made during 1926 but the figures are not yet available.

The lowest individual county expenditure for health service is 5½ cents per person. This is in one of the less progressive sections and situated in the bituminous coal mining district. This industry has not been prosperous in Ohio during recent years.

There are 5 general (county) health districts whose annual expenditures have been in excess of $25,000.00. The maximum was $34,000, with a population of 58,860 for 1926, or a per capita expenditure of 57¾ cents. The whole-time staff of this, the largest general health district department, consists of 1 physician as health commissioner, 1 physician as deputy health commissioner, 1 supervisor of nursing and 6 public health nurses, 1 sanitary officer, 1 clerk and 1 assistant part-time clerk. The minimum expenditure per person of any unit of this group of 5 districts was 46½ cents.

Of a group of 11 county districts whose expenditures were between $10,000.00 and $20,000.00, the maximum per capita rate was 59½ cents and the minimum was 16½ cents per person, with an average per capita cost of 39½ cents.

The average personnel of the departments of this group of 11 county districts consists of a health commissioner who is a physician, an average of 3 public health nurses, 1 clerk, and, in some of the districts of this group, 1 pediatrician and 1 sanitary officer.

Of a group of 42 county districts spending $5,000 to $9,000 annually, the maximum was 59½ cents per capita for a district with a population of only 14,113 and with a total expenditure of $8,403.30. The minimum unit expenditure was 14½

TABLE I

PER CAPITA RATE OF EXPENDITURES OF BOTH STATE AND LOCAL OFFICIAL FUNDS FOR PUBLIC HEALTH

General Health District	Nature of Service	1926 Estimated Population	1926 Expenditure	1926 Gross Per Capita Rate
1		Total 2,320,698**	Total $666,040.32	$0.287
2	*	22,403	1,554.02	0.069
3		21,231	8,667.45	0.407
4	*	15,378	6,292.39	0.409
5		34,892	15,360.18	0.440
6		38,457	11,951.92	0.310
7	*	18,553	3,650.00	0.304
8		74,357	12,356.82	0.166
9	*	22,621	1,962.08	0.086
10		25,036	9,150.00	0.365
11		16,065	3,300.00	0.205
12		17,450	4,530.00	0.260
13	*	20,135	5,442.04	0.270
14	†	28,291	5,685.45	0.200
15	†	17,999	6,455.60	0.356
16	†	37,375	8,980.00	0.240
17	*	18,748	3,475.00	0.185
18	†	18,255	8,197.94	0.449
19	†	58,860	34,000.00	0.577
20		35,807	4,000.00	0.111
21	*	15,673	2,776.71	0.177
22	†	17,257	7,770.00	0.450
23		16,892	10,000.00	0.590
24	†	25,788	5,504.00	0.213
25		13,556	5,195.54	0.383
26		48,627	16,833.36	0.345
27		23,445	3,500.00	0.149
28	†	17,241	1,969.09	0.114
29		15,283	4,945.37	0.323
30		21,788	1,248.90	0.057
31	*	32,820	8,784.89	0.249
32	*	61,153	30,000.00	0.490
33		21,375	4,002.65	0.190
34		21,477	6,219.12	0.289
35		19,996	4,199.62	0.210
36		23,362	4,212.75	0.179
37	*	27,610	3,345.82	0.121
38		17,798	7,500.00	0.421
39	*	16,965	4,175.00	0.245
40		19,269	10,394.00	0.539
41	*	14,813		
42		53,115	7,763.71	0.146
43	†	20,343	4,789.59	0.235
44		24,053	5,847.27	0.243
45		25,533	3,580.00	0.140
46		29,708	$6,013.97	0.202
47	*	20,768	4,932.85	0.237
48	*	33,181	19,712.34	0.594
49		38,134	12,819.05	0.336
50	*	19,662	5,563.54	0.283
51	*	42,309	26,179.46	0.618
52		14,113	8,403.30	0.595
53	*	27,718	7,800.00	0.281
54	*	26,586	1,500.00	0.056
55	†	26,872	5,398.07	0.200
56		26,514	7,754.82	0.292
57	*	20,660	2,030.00	0.098
58		63,531	17,000.00	0.267
59	*	14,555	1,830.49	0.119
60	*	15,570	4,955.59	0.318
61		28,411	7,238.52	0.254
62		17,849	2,405.73	0.135
63		22,193	3,700.00	0.162
64	*	18,739	1,218.00	0.065
65		36,566	8,288.21	0.226
66		18,739	6,100.00	0.326
67		14,151	6,813.00	0.481
68	*	22,968	4,938.56	0.215
69		23,238	6,695.44	0.288
70	†	27,751	6,511.03	0.270
71	†*	21,776	5,822.02	0.267
72	*	25,855	5,519.65	0.213
73	*	24,641	5,456.77	0.225
74	*	33,089	8,533.72	0.257
75	†*	18,814	5,222.06	0.277
76		17,333	6,144.04	0.354
77	†*	55,972	25,976.94	0.464
78	†*	43,795	20,500.00	0.468
79	†*	42,356	16,143.60	0.381
80		32,807	6,510.56	0.198
81		20,918	8,000.00	0.382
82		20,110	7,850.00	0.390
83		12,075		
84	*	26,535	5,000.00	0.188
85	†	27,909	8,333.40	0.298
86		33,960	13,128.62	0.386
87	†	24,627	6,891.24	0.279
88		39,104	8,390.00	0.214
		19,481	2,845.00	0.146

* Full time service.
† Full time (city and county combined) service.
** Exclusive of the two unorganized counties.

cents per capita. This minimum rate was for a county situated within the coal mining district, bordering on the Ohio River, with a population of 53,115 and a total expenditure of $7,763.71 for 1926. Of this group of 42 county districts, the service of 28 was under the direction of a whole-time physician as health commissioner. The personnel of the departments in this group was as follows: 30 county districts had a health commissioner, 1 public health nurse and 1 clerk; 6 districts had a health commissioner and 1 clerk; and 6 districts had a health commissioner only.

Of the remaining 28 general county health districts whose expenditures were less than $5,000 for the year, 25 had part-time health commissioners and 3 had only a whole-time health commissioner. The maximum unit per capita expenditure of this group was 30½ cents, and the minimum 5½ cents per person.

Table I carries in detail the tabulated figures with numbers substituted for the names of the districts.

As evidence of the increased popularity of supervised public health service in rural districts, Table II shows the gradual increase in appropriations by the county budget commissions for the years 1923 to 1927 inclusive.

TABLE II

TABULATION SHOWING NUMBER OF DISTRICTS RECEIVING INCREASED, DECREASED OR THE SAME APPROPRIATIONS FOR GENERAL HEALTH DISTRICTS IN OHIO FOR YEARS 1923–1927 INCLUSIVE

Year	Increased Appropriation	Same appropriation as preceding year	Decreased appropriation from preceding year	No Record	Not Organized	Total Number Districts
1923..	29	22	29	6	2	
1924..	29	19	32	6	2	
1925..	21	39	25	1	2	
1926..	43	20	23		2	
1927..	53	21	12		2	
Average 5-year period.	35	24	28			88

BETTER HEALTH INVESTMENTS

Notwithstanding the increasing tendency on the part of officials charged with responsibility for expenditures of public funds, in recent years, to pare budgets to the literal bone of necessity, reports from general health districts indicate that these officials are developing a keener appreciation of the necessity for liberal appropriations for public health.

There has been a gratifying increase during the last two years in the number of local health districts in which larger appropriations have been granted with consequent stimulation of the work and its broadening into heretofore neglected or subordinated lines. From 1923 to 1925 the tendency was the other way, where health budgets did not remain stationary.

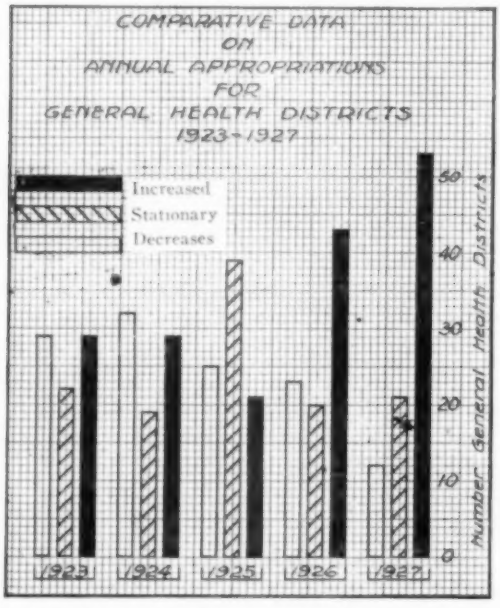
In 1923 appropriations were increased over those of 1922 in 29 general health districts. They remained stationary in 22 districts and showed decreases in 29 districts; in 6 districts no records are available.

In 1924 appropriations were increased in 29 districts; 19 remained stationary and 32 received a decreased budget; records for 6 are unavailable.

The extreme depression seems to have reached its lowest point in 1925. Appropriations were increased in only 21 districts; 29 remained stationary and 25 received decreased amounts; one district's records were unavailable. As appropriations are acted upon approximately one year in advance, this stage of depression in public health appropriations reached its lowest in 1924, the fourth year following the organization of the state in accordance with the Hughes-Griswold Law, but was not apparent until 1925.

In 1926 the trend was toward allowing increased appropriations. The tide had set in. With all organized districts included, 43 received increased appropriations; 20 remained stationary and only 23 districts suffered from budget cuts. This was still more manifest for 1927. Appropriations were increased in 53 districts; 21 received the same amount and only 12 districts received amounts less than the preceding year.

A certain percentage of districts will continue to have difficulty in securing sufficient public funds to achieve an efficient public health administration. This is due to political intrigues, and until the community conscience is sufficiently awakened in these districts to divorce politics from public health, we will have this obstruction in the road to progress of public health administration.



The data tabulated in Table II are expressed in the form of a graph. The figures covering a period of only 5 years cannot be accepted as a true index, but they do indicate that public health administration in Ohio in rural districts is on the up-grade.

COMMENT

The expenditures for public health in rural districts are exclusive of moneys spent for district tuberculosis sanitaria and voluntary public health activities. The figures represent moneys spent by official boards of health in maintaining a general public health program.

It is of interest to watch the progress of an altogether new project in Ohio which began operation February 1, 1927; that of a training base for students of public health. This project was made possible through the coöperation of The International Health Division of the Rockefeller Foundation, the State Department of Health, and the Boards of Health of Darke County General Health District and the City of Greenville. This plan, as formulated, was to set up an organization as near ideal as possible for public health administration which could be carried on in any county and city health district of similar population and property wealth. This training base will receive students of public health who want practical experience in health administration by actually performing the duties common to health work. Physicians receiving appointment as health commissioner in Ohio and who have not had experience in public health will be given a short course of training with this unit. It is also the plan, after the unit is functioning well, to provide courses of training for registered nurses who desire to enter public health nursing service. One of the results which it is hoped to demonstrate is that efficient rural health administration can be provided for a per capita expenditure of reasonable proportions.

ACTIVITIES

In order to justify the statement that the per capita expenditures for general health districts (rural) were for maintaining a fairly well rounded public health program, a résumé of the major activities in given. It will be noted that a majority of the units have carried on a program, not ideal to be sure, but at least equal to the average program recommended by recognized authorities on public health administration.

These data are based on incomplete returns of the annual reports of local health departments to the State Department of Health. A prescribed annual report form was used for the first time for the year 1926 and many districts were unable to furnish complete data of their activities. Without question a very great improvement in reporting will be noted for the

year 1927. In response to a questionnaire supplementary to the annual report form, more than 80 per cent of all local health districts agreed to improve their system of record keeping and requested the continuance of such a report form. Also 60 per cent of the health commissioners indicated that a report form, based on the tentative standard *Appraisal Form for City Health Work* recommended by the American Public Health Association, was a valuable aid to them in arranging a program of public health activities for the succeeding year. This benefit in itself would seem to justify its continued use.

SUMMARY OF MAJOR ACTIVITIES

Public Health Administration

47 districts had a full-time health commissioner. Salaries ranged from $2,000 to $6,000 per year.

39 districts had a part-time health commissioner. Salaries ranged from $1,000 to $3,000 per year.

46 districts were securing systematic newspaper publicity.

46 districts provided 2,252 lectures during year, an average of 48 lectures on public health subjects for each of these 46 districts.

Clerks and Clerical Service

46 districts employed full-time clerks. Salaries ranged from $900 to $2,100 per year.

14 districts employed part-time clerks.

69 districts routinely indexed and made annual tabulation of deaths and births according to age, sex, color, nativity, etc.

17 districts used graphic charts for major communicable diseases.

Communicable Disease Control

39 districts reported 117,712 children immunized with toxin-antitoxin against diphtheria during current year.

(According to incomplete reports, the total number of children during the past three years immunized with toxin-antitoxin in Ohio is 236,603, with 346,677 receiving the Schick test.)

73 districts were isolating positive diphtheria carriers.

67 districts routinely made throat cultures on immediate diphtheria contacts.

83 districts reported a total of only 21 cases of diphtheria occurring in children having had toxin-antitoxin immunization treatments.

Typhoid Control

48 districts reported 4,399 persons receiving anti-typhoid immunization.

Smallpox

66 districts showed an average of 44.3 per cent of school population successfully vaccinated.

50 districts showed 44,445 persons vaccinated or re-vaccinated during current year.

43 districts reported an average of 39½ per cent of adult population successfully vaccinated against smallpox.

Serums and Vaccine Service

86 districts (mandatory statute provision) provided free diphtheria antitoxin to all physicians for all cases of diphtheria, also free distribution of triple anti-typhoid vaccine and of silver nitrate prophylactic for eyes of the newborn.

Child Hygiene

41 districts reported 13,656 visits of public health nurses to infants under 2 years of age.

Preschool Service

47 districts reported 14,877 visits of public health nurses to preschool children.

Public Health Nursing and Other Service

57 districts employed 99 whole-time public health nurses.

64 districts were reported in which medical and dental supervision were under the auspices of the district board of health.

63 districts examined 196,069 children during current year.

In 62 districts school enumerators reported to local health departments 1,842 crippled children.

33 districts discovered and recorded 506 additional crippled children, from other sources.

55 districts reported 128,139 school children having physical defects. Average per cent of defects corrected was 28.

In 19 districts, a physician made physical examination of school children.

In 14 districts the public health nurse, alone, made inspections.

In 35 districts both the physician and the nurse carried on examination and inspection.

Sanitation: Food and Milk Control

61 districts received and investigated 5,658 complaints of insanitary conditions.

59 districts made 20,630 sanitary inspections and re-inspections, exclusive of plumbing, food and communicable disease inspections.

44 districts made 19,161 inspections and re-inspections of food handling establishments.

Tuberculin Testing of Cattle

19 districts have 100 per cent of cattle tuberculin tested.

5 districts have 90 per cent of cattle tuberculin tested.

5 districts have 75 per cent of cattle tuberculin tested.

Tourist Camps

86 districts inspected tourist camps from the standpoint of sanitation, water, garbage disposal and sewage disposal, and issued permits to operate only to those camps meeting the standards in accordance with the regulations of the State Department of Health.

Miscellaneous

There should be recorded the attendance of health commissioners at quarterly district conferences and at the annual conference of health commissioners with the State Department of Health.

REFERENCE

1. Williams, H. Expenditures per capita for Health Work in New York State. *A. J. P. H.*, 16:8, 774 (Aug.), 1926.

RELATION OF REGIONAL PLAN WORK TO PUBLIC HEALTH ENGINEERING

HOWARD E. LONG

Executive Secretary, Niagara Frontier Planning Board, and Association Niagara Region, N. Y.

AS THE health and safety of the individual are but the result of the facility with which he can provide himself with the essentials to life and as the health of the public is but the composite of the individuals comprising the community, so the public health engineer in the fullest sense is concerned in seeing that the supply of air, light, food and water is unadulterated, that adequate heat and shelter are available, and that the disposal and elimination of waste products are unrestricted. In like manner, the regional planner is engaged in the work of planning and developing adequate present and future means of accomplishing facility of supply, as well as purity of supply.

OBJECT OF REGIONAL PLANNING

The object of regional planning is to develop a region to the best possible advantage to the health and safety, comfort and convenience of its inhabitants, and to make it possible for every inhabitant to live a healthy and happy life, while carrying on the gainful occupation necessary to support it. Public health is therefore obviously an important consideration of city and regional planning, and the aims and objectives of the public health engineer are inextricably connected with those of the planning engineer.

HEALTH AND PLANNING ENGINEERS ON COMMON GROUND

Obviously, certain phases of public health work, such as laboratory investigations, matters of hygiene, and educational propaganda among the (so-called) lower classes, the uneducated masses, are in practice beyond the scope of the planner's program. Nevertheless, the health engineer and the planning engineer meet on common ground and should cooperate to the fullest possible extent in subjects wherein community of interest and regional attention to futures are indicated. For example, in the fields of sewage disposal, food and water supply,

air and light, housing and zoning, recreation, hospital and convalescent facilities, and education, the work of the planner augments that of the sanitarian, and *vice versa*.

SEWERAGE

Specifically, the planning engineer attempts to provide for the future development of the city and the region in indicating means for developing more economic and practicable schemes for sewage disposal, and for preventing the pollution of public water courses; in suggesting plans for eliminating the disposal of sewage into a flowing stream with consequent danger to other communities along its course, the congestion of modern urban centers creating dangers from these old methods of disposal not encountered in an earlier day. Here the vital need of intercommunity coöperation is obvious, and here the problem becomes a regional problem.

WATER SUPPLY

In the field of water supply, the constantly increasing growth toward each other of adjacent communities, and the development of the intervening open areas, raises the question of intercommunity supply and distribution, and forces the subject of volume and quality of water supply into the regional problem. Reciprocal and united action becomes more and more necessary and the regional planning engineer here steps in to avoid waste of public funds, by making adequate provisions for the future. Studies of past developments and of present trends enable him to forecast with surprising accuracy probable future requirements; by zoning he can specify where residential, mercantile and industrial development shall occur, and hence, how and where future requirements must be provided for. It is of paramount importance that future needs be given careful consideration, for under our fairly uniform methods of constructing public improvements by means of bond issues, the future generations are required to share in the cost of such improvements.

FOOD SUPPLY

While the food supply is largely an economic problem, questions of public health undoubtedly arise. The regional planner provides for the reservation of lands for agricultural purposes, plans increased facilities for transporting the food products there raised, and determines where marketing centers should be located to the best advantage.

HAZARDS TO HEALTH

Dust, smoke, objectionable odors, and poisonous gases in the air are in varying degrees detrimental to health. The subject of air pollution is more and more engaging the attention of the health worker, who will soon be confronted with the problem of determining the degree of such pollution at which active danger arises, and in devising means for purification in the face of the constantly increasing pollution from automobile waste gases and similar sources. This raises the question of the desirability or necessity for the regional planner (as a matter of public health) to locate the most congested traffic ways, particularly for through-traffic, outside the borders of our cities, just as the zoning engineer should plan his industrial zones in such manner as to eliminate the possibility of prevailing winds carrying industrial smoke, gases and odors into residential areas, or into agricultural developments where in well-known instances certain waste fumes are destructive of vegetation. And in considering the aspects of light and air in their relation to health, the housing engineer and the zoning engineer are doing very serviceable and very commendable work in providing for restrictions as to the area of land which may be occupied by structures, in specifying setbacks and open spaces to insure adequate sunlight, ventilation, sanitation and safety.

In connection with this phase of public health and of planning, it may be said that far too scanty attention is being paid by public health engineers and by planners generally to the practical contribution to

this subject which is being made by those central heating engineers and public service companies who are engaged in the design and operation of central heating systems from which metered heating service is supplied from a central boiler plant, through underground mains. As a result of this service, in communities fortunate enough to possess it, thousands of isolated residential and mercantile heating plants are eliminated, with their attendant coal and ash dust and gases, the deleterious effects of which in any large community should not be overlooked. (Incidentally, the Niagara Region is unique in this respect, that it contains the first system of this kind ever constructed, and that here is operated the pioneer and largest organization in the world devoted to engineering and manufacturing for this beneficial enterprise.)

MODERN ERA ONE OF TREMENDOUS NERVOUS STRAIN

"All work and no play makes Jack a dull boy" has long been accepted as a good health motto. How much more is it the case then in this modern era of tremendous nervous strain when dangers of accidents surround us on every hand, when our ears are continuously assailed, during our working, our playing and our sleeping hours, with the noises, old and new, incident to this strenuous age? If he is not already doing so, the public health student must soon take under serious consideration the question of whether the constantly increasing population of our detention institutions may not in large measure be accounted for by the blatant rumble and clamor, rattle and clang to which the auditory nerves are constantly subjected in our urban surroundings.

(A great American has recently been quoted as welcoming the time when this constant hub-bub will permanently have depreciated the auditory powers of the community, but it may still be probable that the great majority will continue to desire the full use of all of their inherent faculties.)

RECREATION AND QUIET

While the public health student is solving that problem, the planner and zoner will hasten (while open-area land values are still relatively low) to set aside adequate space and provide adequate facilities for recreation, and for release from the urban clamor—parks where the harassed father and the worried mother may go for relief of tired nerves; playgrounds where the children may play in the suburban surroundings denied them near their homes; athletic fields and swimming pools where the growing young people may engage in the exercise necessary to prepare their bodies to resist the strain of modern life; parkways and boulevards where the family may drive into the open country areas for fresh air, for relaxation, and for change of scenery; reservations where space is available for camping and for life in the open air.

The demand for increased acreage for community recreation is becoming more and more insistent, largely because of the growing need for quiet zones, segregated from the inescapable turmoil of business districts.

Though susceptibility to noise varies within wide limits, it is nevertheless generally true that residential, school and hospital districts should enjoy every possible relief from disturbances. Particularly is this true at night in residential and hospital zones. Especially in persons of neurotic tendencies is the need for such relief indicated.

Here again, the public health engineer and the planning engineer have a mutual problem. It is found that desirable park and recreational sites frequently are found in spots where land values are exceptionally low due to topographical characteristics preventing other developments, and where disuse of such areas has resulted in accumulations of rubbish and garbage and similar unsanitary conditions. Attention is here directed to the marvelous work which has been done by the Westchester County Park Commission and others in reclaiming creek bottoms, re-

covering natural scenic beauty spots, while at the same time eliminating unsanitary eyesores.

It frequently happens in the tremendous growth of metropolitan areas, that hospital and convalescent institutions once situated in quiet surroundings become submerged in mercantile and industrial neighborhoods and, even if that condition be avoided, that the increased volume of automobile traffic destroys that quiet and peaceful atmosphere which is essential to recovery. Especially is this serious where diseases of the mind are involved. Here arises a new aspect of the regional planning problem—provision for removal of such institutions to new and peaceful surroundings with zoning restrictions, the possibility of and necessity for which were not conceived when the original structures were erected.

SCHOOLS

The planning engineer must give serious and more urgent consideration to the question of public school sites. All too frequently schools are located on heavy traffic thoroughfares, and while it is true that our schools should be easily accessible from the homes of the children attending them, the "SCHOOL ZONE, DRIVE SLOW" sign is far too frequent for the safety of the young. It is said that automobile casualties near our schools are increasing in number, and the time is not far distant when school authorities must take cognizance of the necessity for placing schools at a distance from main-traveled arteries, or in cases of existing structures, of providing through the police power for the diversion of traffic from the school neighborhood. Often the school land is so largely occupied by the structures, as to leave no provision for the very necessary play space where the children may engage in open-air recreation without having their lives endangered. This obviously is a most important aspect of the educational field and should have the serious consideration not only of the educator, but of the planner, and of the safety engineer.

BURIAL PLACES

Another consideration of the health authority and of the planning engineer which may be touched on briefly is the growing need for adequate future burial spaces (cemeteries and crematories) outside urban areas, and the necessity for some altered treatment of those which were formerly located on the urban outskirts but have now been surrounded by the subsequent development. It may be probable that public opinion one day may be educated to a point where a city cemetery need no longer display a hideous collection of inharmonious examples of the commercial sculptor's handiwork, of vulgar show in cold granite of the capitalized grief of the erectors, but may become a place of beauty, of stretches of rolling green lawn broken only by well ordered shrubbery, with attractive and comfortable seats where the survivors and their contemporaries may enjoy in that quiet spot a temporal measure of the rest which typifies the eternal rest of the beloved remains there disposed.

IMPORTANCE OF COÖPERATION

Many of the points of contact between the public health engineer and the regional planning engineer here sketchily referred to may appear to be perfectly obvious, yet it has seemed desirable to direct specific attention to them in an effort to stress the importance of coöperation between the workers in these phases of public service engineering.

WAYSIDE SPRING AND MARKER PLACED BY THE MERCER COUNTY AUTOMOBILE CLUB

STATE AND COUNTY HEALTH DEPARTMENTS INSURE SAFE DRINKING WATER TO MOTORISTS

MILDRED G. DURBIN
Columbus, O.

OHIO is applying the principle of Safety First to the wayside spring.

The State Department of Health and the county health departments inspect the sources of water supplies used by the motoring public. Most of these are wells from which the water is obtained with a hand pump. They include the well at the tourist camp, the country church, the small school and the filling station.

The first step is inspection as to location with reference to drainage, cesspools, etc. The second consideration is the type of well; that is, whether dug, driven or drilled. The character of the casing and the well top are also inspected. The third point is the analysis of samples.

If the well or spring is unsafe on any of these points, advice is given as to remedy or abandonment.

When the water supply is satisfactory, a dated seal of safety, a small yellow enameled metal disk, is so placed that the user of the water will see it. Inspections are made from time to time by the county health authorities.

Several automobile clubs and the Division of Highways of the State of Ohio have coöperated in advertising approved supplies of water. The automobile clubs erect standard metal club markers adjacent to safe water, after it has been so designated by the Department of Health; while along state maintained roads, the Division of Highways has erected standard signs which read: "Safe Drinking Water 500 Feet Ahead."

By the coöperation of these three agencies, the roadside well or spring in Ohio has become a safe place at which to drink.

MILK-BORNE DISEASE IN MASSACHUSETTS *

GEORGE H. BIGELOW, M.D.
State Commissioner of Public Health

AND

FILIP C. FORSBECK, M.D.
State Epidemiologist,
Boston, Mass.

IN 1916 Kelley[1] reported on the part played by milk in the spread of disease. This was followed by a paper by Kelley and Osborn[2] in 1920, in which the data were brought up to date and an estimate made of the percentage of pasteurized milk sold. In a third chronological report, in 1924, Kelley and Webber[3] again brought the subject up to date and made an estimate as to the per capita consumption of milk. In the present paper, previously reported data have been recapitulated, and statistics added in regard to dairy inspection, tuberculosis-free herds, laboratory examination, number of milk inspectors, and number of pasteurizing plants.

Questionnaires were sent to the 70 cities and towns of 10,000 population and over, and replies were received from 44. The population of the towns from which we received information is 70.2 per cent of the total population of the state.

In the following tables the data for the past three years are tabulated with comparative figures from the previous reports, when these are available.

It will be noted in the triennium 1924–1926, that there has been a further reduction in the percentage of cases of typhoid fever traced to milk. This has gone hand in hand with the increase in the percentage of pasteurized milk used. Even more marked is the reduction to zero of milk-borne epidemics of septic sore throat. Scarlet fever and diphtheria show a slight and insignificant increase in the percentage of milk-borne infection. It will be noted further that the total percentage of milk-borne cases has been reduced from about one-half of 1 per cent in 1919–1923, to about one-third of 1 per cent in 1924–1926.

TABLE I

PROPORTION OF CASES OF TYPHOID FEVER, SEPTIC SORE THROAT, SCARLET FEVER, AND DIPHTHERIA TRACED TO MILK

Disease	Cases Reported	Traced to Milk	Per Cent
1907–1914			
Typhoid Fever	23,482	2,215	9.43
Septic Sore Throat	*	(2,512)	...
Scarlet Fever	70,569	2,747	3.89
Diphtheria	69,646	131	0.18
Total	163,697	5,093†	3.11
Yearly average	20,462	637	3.11
1915–1918			
Typhoid Fever	6,331	496	7.83
Septic Sore Throat	1,401	867	61.88
Scarlet Fever	25,328	140	0.55
Diphtheria	33,807	30	0.08
Total	66,867	1,533	2.29
Yearly average	16,717	384	2.29
1919–1923			
Typhoid Fever	4,105	297	7.23
Septic Sore Throat	829	118	14.23
Scarlet Fever	46,777	53	0.11
Diphtheria	42,386	8	0.018
Total	94,097	476	0.505
Yearly average	18,819	95	0.505
1924–1926			
Typhoid Fever	1,705	81	4.10
Septic Sore Throat	415	0	0.00
Scarlet Fever	36,052	56	0.16
Diphtheria	15,173	25	0.16
Total	53,345	162	0.31
Yearly average	17,782	54	0.31

* Not reported until 1915
† Sum does not include septic sore throat

In Tables II and III are tabulated the relative frequency of cases and outbreaks respectively of the four diseases con-

* Fourth Chronological Report from the Massachusetts Department of Public Health.

sidered. The relative importance of the other diseases has become greater because of the striking fact that there were no outbreaks of septic sore throat during the triennium.

TABLE II

PERCENTAGE DISTRIBUTION OF THE MILK-BORNE DISEASES BY CASES

Disease	Cases Traced to Milk	Average Number of Cases Per Year	Per Cent of All Cases Traced to Milk
1907–1914			
Typhoid Fever	2,215	277.9	29.13
Septic Sore Throat	2,512	314.0	33.03
Scarlet Fever	2,747	343.4	36.12
Diphtheria	131	16.4	1.72
	7,605	950.6	100.00
1915–1918			
Typhoid Fever	496	124.0	32.36
Septic Sore Throat	867	216.7	56.56
Scarlet Fever	140	35.0	9.13
Diphtheria	30	7.5	1.95
	1,533	384.2	100.00
1919–1923			
Typhoid Fever	297	59.5	62.40
Septic Sore Throat	118	23.6	24.80
Scarlet Fever	53	10.6	11.12
Diphtheria	8	1.6	1.68
	476	95.2	100.00
1924–1926			
Typhoid Fever	81	27.0	50.00
Septic Sore Throat	0	0.0	0.00
Scarlet Fever	56	18.7	34.60
Diphtheria	25	8.3	15.40
	162	54.0	100.00

In studying the chronological history of milk as a source of infection, it is important to note carefully the relative change in outbreaks and cases in order that there may be no false impression as to the increased safety of the product. According to our figures the yearly average number of cases in 1924–1926 was about one-twelfth as many as in 1907–1914. The average number of outbreaks, however, was reduced to about one-third the number occurring during 1907–1914. Relative study, therefore, indicates that the vulnerability of milk as a vehicle of infection is about four times as great as the impression given by noting the reduction in cases alone, during this 20-year period.

TABLE III

PERCENTAGE DISTRIBUTION OF THE MILK-BORNE DISEASES BY OUTBREAKS

Disease	Outbreaks Traced to Milk	Average Number Outbreaks Per Year	Per Cent of All Outbreaks Traced to Milk
1907–1914			
Typhoid Fever	50	6.25	69.45
Septic Sore Throat	7	0.87	9.72
Scarlet Fever	10	1.25	13.89
Diphtheria	5	0.62	6.94
	72	9.00	100.00
1915–1918			
Typhoid Fever	16	4.00	57.14
Septic Sore Throat	7	1.75	25.00
Scarlet Fever	4	1.00	14.29
Diphtheria	1	0.25	3.57
	28	7.00	100.00
1919–1923			
Typhoid Fever	12	2.40	70.59
Septic Sore Throat	3	0.60	17.65
Scarlet Fever	1	0.20	5.88
Diphtheria	1	0.20	5.88
	17	3.40	100.00
1924–1926			
Typhoid Fever	7	2.33	77.78
Septic Sore Throat	0	0.00	0.00
Scarlet Fever	1	0.33	11.11
Diphtheria	1	0.33	11.11
	9	3.00	100.00

The per capita consumption of milk is greater than that for 1923, but is still not so great as for 1919. In Massachusetts the policy is to recommend, in general, 1 quart of milk per day for school and preschool children and 0.5 quart after adolescence. Estimating the school and preschool population to be 30 per cent of the total population, the average milk consumption should be 0.65 quart per capita. Since many drink much more than the average amount, namely 0.5 quart per capita, there must be a con-

TABLE IV

LIST OF OUTBREAKS TRACED TO MILK 1924–1926, INCLUSIVE

Year	Month	Place	Disease	Cases	Source
1924	July-August	Wakefield	Typhoid Fever	6	Carrier
1924	September	Fitchburg	Typhoid Fever	12	Carrier
1924	September	Gardner	Typhoid Fever	6	Carrier
1925	September-October	Quincy	Typhoid Fever	8	Unknown
1925	May-June	Stoneham	Diphtheria	25	Case
1925	January	Clinton	Scarlet Fever	56	Case
1926	September-October	Belmont	Typhoid Fever	21	Case
1926	November-December	Lincoln-Concord-Weston	Typhoid Fever	50	Carrier
1926	December	Boston	Typhoid Fever	28	Case
				9	212

TABLE V

THE PER CAPITA CONSUMPTION OF MILK

	Number of Cities	Quarts Sold Daily	Quarts per Capita
1926*			
I Cities of 50,000 and over	15	1,145,834	0.52
II Cities 25,000–50,000	10	217,435	0.50
III Cities 15,000–25,000	12**	83,684	0.36
IV Cities and towns 10,000–15,000	6	35,406	0.43
	43	1,482,359	0.502
1923†			
I Cities of 50,000 and over	12	836,937	0.46
II Cities 25,000–50,000	10	212,164	0.50
III Cities 15,000–25,000	10	79,877	0.38
IV Cities and towns 10,000–15,000	9	42,768	0.38
	41	1,171,746	0.456
1919‡			
Towns of all sizes	—	1,350,000	0.556

* Based on 44 of the 70 cities over 10,000 population or 70.2 per cent of the total state population.
† Based on 41 of the 67 cities over 10,000 population or 65 per cent of the total state population.
‡ Based on towns of all sizes representing 61 per cent of the total state population.
** In 1 city of the 13 in this group information was not available regarding consumption.

siderable number who drink even less than the average, so that we can reasonably urge that the consumption of milk be increased at least 25 per cent.

In the cities and towns of 10,000 and over, 83 per cent of the milk is now pasteurized as compared with 74 per cent in 1923. The most encouraging advance is shown in the communities of 10,000–15,000, where the relative amount of pasteurized milk has trebled. The 1919 figure is hardly comparable because it includes data from very small towns as well as those over 10,000.

Table VI shows that the amount of certified milk sold is negligible, amounting to about one-half per cent of the total amount sold. Comparative figures for other years are not available.

TABLE VII

MILK INSPECTORS, 1926

	No. of Towns in Analysis	No. of Towns with Inspectors	Per Cent of Towns with Inspectors
I	15	15	100.0
II	10	9	90.0
III	13	12	92.3
IV	6	6	100.0
	44	42	95.5

It was found that two towns were without a milk inspector, one of these a city of almost 50,000 inhabitants.

The number of inspections per 100,000 quarts of milk sold is tabulated in Table VIII. The number of unsatisfactory dairies varied from 0 to 100 per cent, according to the reports. It is evident that there is need for a uniform system in grading dairies. Surely the dairies inspected by group III towns and found unsatisfactory were not eight times as

TABLE VI

PASTEURIZED AND CERTIFIED MILK

(In this and the following tables the groups of cities will be represented by Roman numerals)

	Quarts Pasteurized	Per Cent Pasteurized	Quarts Certified	Per Cent Certified	Population
		1926			
I	1,048,978	91.3	6,109	0.53	2,201,492
II	139,018	63.9	1,621	0.75	434,145
III	29,825*	35.6*	690*	0.82*	233,168*
IV	12,102	34.1	150	0.42	83,098
	1.229,923	83.0	8,570	0.58	2,951,903
		1923			
I	688,975	82.2	—	—	1,821,344
II	138,260	65.1	—	—	425,960
III	34,583	43.4	—	—	209,110
IV	4,630	10.8	—	—	112,614
	866,448	74.0			2,569,028
		1919			
	460,000	34.0	—	—	2,425,950

* On this data information was not received from one of the thirteen towns.

numerous as those inspected by group IV towns. We are not prepared to say which figure is the more rational.

TABLE VIII
DAIRY INSPECTIONS, 1926

	Quarts per Year	No. of Inspections per Year	Inspections per 100,000 Quarts of Milk	Per Cent Unsatisfactory
I	418,000,000	15,342	3.67	17.6
II	79,300,000	2,439	3.07	6.3
III	12,930,000	1,661	5.43	21.3
IV	30,520,000	206	1.59	2.5
	540,750,000	19,648	3.635	—

TABLE IX
CHEMICAL AND BACTERIOLOGICAL EXAMINATIONS, 1926

	Chemical Examinations	Chemical Examinations per 100,000 Quarts	Bacteriological Examinations	Bacteriological Examinations per 100,000 Quarts
I	46,291	11.08	22,051	5.27
II	5,117	6.44	2,313	3.12
III	2,716	25.70	1,324	12.55
IV	1,142	3.74	479	1.69
	55,266	10.27	26,167	19.95

It will be noted that there are relatively more milk inspections, bacteriological examinations, and chemical examinations in group III (15,000–25,000) than in the other groups.

TABLE X
CITIES AND TOWNS IN MASSACHUSETTS WHICH REQUIRE THAT ALL MILK BE EITHER PASTEURIZED OR FROM TUBERCULOSIS-FREE CATTLE

	No. of Towns	Population of Cities and Towns Having Requirement	Total Population of Groups	Per Cent of Total Population Having Requirement
I	9	1,508,962	2,201,492	68.6
II	3	118,386	573,447	20.6
III	4	76,839	439,856	17.5
IV	5	69,406	228,586	30.3
V*	2	16,203	380,721	4.3
VI†	2	4,995	390,040	1.3
	25	1,794,791	4,214,142	42.7

* 5,000–10,000.
† 0–5,000.

At present, based on local regulations, less than half of the milk is free from the possibility of being the source of bovine tuberculosis. However, it is encouraging that recently several of the smaller cities and towns have made regulations requiring that the milk sold in their towns be either pasteurized or from tuberculosis-free herds.

If we add to the population of the towns protected by regulations requiring that milk be either pasteurized or from non-tuberculous cows, 1,794,791, the figure of 772,681, the population protected by pasteurization in towns over 10,000 without such regulations, we have a total population of 2,567,472, or 61 per cent of the population of the state protected against infection with bovine tuberculosis.

On the other hand, 83 per cent of the milk consumed by the 2,952,000 individuals living in 43 communities over 10,000 is pasteurized. Figures on the consumption of pasteurized milk in smaller communities and in 27 of the towns over 10,000 are not available. But if the pasteurization is adequate, at least 2,450,000, or 58 per cent of the total population of the state, are protected against contracting typhoid fever, septic sore throat, scarlet fever and diphtheria from milk. The adequacy of the pasteurization will be more generally assured in the future by the recent legislation regarding licensing of pasteurization plants.

It should be remembered that in the striking decrease in the amount of disease traced to milk, bovine tuberculosis has not been included because of the obvious difficulty in tracing such infection. But this disease is of considerable importance, because of 3,564 tests made on cattle in 1926 in Massachusetts, 40.5 per cent were found to be reactors. The Division of Animal Industry of the Department of Conservation estimate that at least 25 per cent of the untested cattle of Massachusetts are reactors. With the definite tracing of certain outbreaks of poliomyelitis to infected milk,[4, 5, 6, 7] and the suggestion that undulant fever may be so spread,[8, 9] future studies of milk-borne disease may have to be considerably broadened.

TABLE XI
PASTEURIZING PLANTS, 1926

	Number of Plants
I	249
II	22
III	24
IV	9
	304

Pasteurizing plants per 1,000,000 inhabitants: 102.9

SUMMARY

In 44 cities and towns of over 10,000 population:

1. The per cent of milk-borne typhoid fever, septic sore throat, scarlet fever, and diphtheria has steadily decreased over a period of 20 years.
2. There have been no epidemics of septic sore throat in the last 3 years.
3. The average number of milk-borne outbreaks per year continues to decrease, but at a much slower rate than the decrease in cases.
4. Apparently, there has been a 10 per cent increase in the per capita consumption of milk over 1923, but a further 25 per cent increase seems desirable.
5. Eighty-three per cent of the milk is pasteurized as compared with 74 per cent in 1923 and 34 per cent in 1919.
6. About ½ per cent of the milk is certified.
7. Over 95 per cent of the towns have milk inspectors.
8. Milk inspection standards vary greatly.
9. About 10 chemical and 20 bacteriological examinations are made per 100,000 quarts of milk. There is a wide range of variation in different towns.

For the state as a whole:

1. About 61 per cent of the population of the state is protected against possible infection with bovine tuberculosis. About 42 per cent live in communities where the entire population is so protected through the requirement that all milk be either pasteurized or from tuberculosis-free herds.
2. At least 58 per cent of the population of the state is protected by pasteurization from typhoid fever, septic sore throat, scarlet fever, and diphtheria.
3. There is 1 pasteurizing plant to about every 10,000 individuals.

CONCLUSIONS

The progress made in decreased milk-borne disease and increased milk supervision in the period 1924–1926 is considerable, particularly in the small cities. However, we feel that it should be stressed that the vulnerability of a milk supply is more accurately estimated by the number of outbreaks for which it is responsible than by the total number of cases. By such a standard, the improvement during the 20-year period is only a quarter of what it would be if the total cases were considered. There is also evidence of an increased consumption. This, however, can probably be further increased with benefit to the community but must be accompanied by still greater efforts at increasing the safety of the product. This need has been thoroughly studied by Crumbine.[10] The new points covered in this paper will be of more value when compared with corresponding data a few years hence. In view of the rapid advances made in cities of 10,000–15,000, the group 5,000–10,000 will be included in subsequent analyses. It is to be regretted that bovine tuberculosis cannot well be included in such a study. Also, the possibility of poliomyelitis and undulant fever featuring in milk-borne disease investigations of the future must be considered.

REFERENCES

1. Kelley, E. R. Milk-borne Infection. *J.A.M.A.*, 67:1997 (Dec. 30), 1916.
2. Kelley, E. R., Osborn, S. H. Importance of Milk Infection in Transmission of Certain Communicable Diseases of Man. *A.J.P.H.*, 10:66 (Jan.), 1920.
3. Kelley, E. R., Webber, W. G. Milk-borne Disease in Massachusetts. *A.J.P.H.*, 14:963 (Nov.), 1924.
4. Lavinder, C. H., Freeman, A. W., Frost, W. H. *Pub. Health Bull.*, 91:151 (July), 1918.
5. Dingman, J. C. Report of a Possibly Milk-borne Epidemic of Infantile Paralysis. *New York State J. Med.*, 16:589 (Dec.), 1916.
6. Knapp, A. C., Godfrey, E. S., Aycock, W. L. An Outbreak of Poliomyelitis: Apparently Milk-borne. *J.A.M.A.*, 87:635 (Aug. 28), 1926.
7. Aycock, W. L. Broadstairs England Epidemic. To be published.
8. Evans, Alice C. Studies on Brucella (Alkaligenes) Melitensis. *Bull. Hyg. Lab. U.S.P.H.S.* 143, 1925.
9. Evans, Alice C. Human Infections with Organism of Contagious Abortion of Cattle and Hogs. *J.A.M.A.*, 88:630–632 (Feb. 26), 1927.
10. Crumbine, S. J. A Summary of a Milk Survey in Twelve States. *American Health Congress Series*, 3:157, 1926.

AUTOMOBILE EXHAUST GAS POISONING IN CHILDREN

J. C. SINCLAIR BATTLEY, M.B.
Detroit, Mich.

THAT the automobile has been a boon to humanity, no one will deny, but it is also undeniable that it has left certain disastrous effects in its wake. Especially is this so in regard to children. Many are the accidents entailing loss of life or limb; and in a way not popularly realized, an insidious influence is probably at work in the effect of motor exhaust gases on the actively growing tissues of the young. Evidence of poisoning in adults is at hand in the fatalities and serious illnesses caused by exposure to excess exhaust vapors. Every year brings a list of deaths from accidental exposure in closed garages, and a baleful influence is exerted on the health and earning capacity of those working in poorly ventilated automobile repair shops.

In 1923, Henderson and Haggard,[1] in a plea for a vertical exhaust in motor cars, described the conditions in city streets resulting from the discharge of gases from the type of exhaust then (and now) in use. In summary they said:

> Carbon monoxide, a colorless, nearly odorless gas, is present in high concentration, 5 to 6 per cent, in the exhaust gases of automobiles; with poorly adjusted carburetors the amount is much higher than with those properly adjusted. A stationary car with motor running fills the air behind it at respiratory level with 4 to 6 parts of carbon monoxide per 10,000 parts of air; when running 10 miles per hour, occupants of a car 30 feet behind are surrounded by exhaust gases diluted to a concentration of 1 or 2 parts of carbon monoxide per 10,000 parts of air. One part of carbon monoxide in 10,000 is a frequent condition in streets where traffic is heavy, and in unusually congested areas a higher amount is present. Thus people may be exposed to this gas in a concentration equal to or above a well founded health standard. Gasoline, in itself, gives an exhaust the only poisonous constituent of which is carbon monoxide. Some motor fuels, containing a high content of benzene and other related substances, produce other toxic gases, which are among the most harmful of vapors, and show a cumulative and progressive effect resulting in serious disturbance. The exhaust gas from automobile motors is far more toxic than that which rises from dwelling or factory chimneys. A most important consideration is that a prolonged exposure to a low concentration of the gas has essentially the same effect as a short exposure to a high concentration.

The production and use of automobiles have increased by leaps and bounds since 1923. One company has just completed its fifteen millionth car. Types of cars with large gasoline consumption, belching out large amounts of exhaust gas, are more in use than formerly as trucks, city omnibuses, and large buses for interurban travel. Modern systems of traffic control necessitate much starting and stopping, waiting, and shifting of gears with consequent greater pollution of the air. On week days a main downtown city street is crowded with cars at nearly all times of the day, and at rush hours arteries through the residential sections become greatly congested. On Sundays and holidays, highways leading to and from the city show an unending stream of motor vehicles, especially in the late afternoon or evening, when people are homeward bound. A pall of blue smoke hangs over the roads and the stench of burnt oil prevades everywhere. It is not an uncommon experience to be 2 hours going 25

or 30 miles on a crowded road with cars immediately in front and behind, and with frequent starts, stops, and waits. It would seem safe to say that the atmospheric content of carbon monoxide in city streets is to-day greater than at the time of Henderson's and Haggard's report.

CONSTANT EXPOSURE CAUSES DEFINITE ILLNESS

Shumway[2] has reported several adult cases in which definite illness has ensued through more or less constant exposure to exhaust gas under the usual conditions of city life. Wilson, Gates, Owen and Dawson[3] have examined the blood of traffic policemen after an ordinary day's work, and found it to contain in some instances as high as 30 per cent saturation with carbon monoxide, at which point mild subjective symptoms become apparent. Stevens[4] has recently reported a case of carbon monoxide poisoning in an infant, which went on to fatal outcome without realization in the home of what was happening. Only after the condition was recognized at the hospital, and a search of the house made, was a leaking gas fixture found, which had in no way been suspected. Stevens refers to the fact that younger children and especially infants have a peculiar susceptibility to the poisonous effects of the gas, and quotes Boehm as saying: "It is quite certain that children succumb rapidly to the action of the poison."

The action of carbon monoxide in the streets presents a different problem from acute poisoning. Exposure is to a comparatively small concentration of the gas, it is alternated by periods when the air is free from pollution, and may go on day after day for long periods of time. Mild grades of poisoning are difficult to detect, and indeed one would suspect that few subjective symptoms need be present, especially in children who do not mention them so readily, yet exposure has an insidious influence on health. It may be that in city children, general poor health, failure to gain, lack of appetite, poor color, flabbiness of tissue, and an undue susceptibility to infection are caused, in part, by prolonged inhalation of carbon monoxide and other products of motor fuels. How often one sees infants and children, who have done poorly in the city where milk and water supply are excellent and sanitation good, improve markedly when the family moves to the suburbs or to adjacent small communities. Less restriction for exercise and more sunlight are usually felt to be the beneficial factors, but may not the ever present evil of automobile exhaust gas play some part in the problem?

It is generally conceded that there is no direct toxic effect of carbon monoxide on the body, the damage being done by anoxemia, but it may be that the poisonous gases from the combustion of benzene affect tissue directly. The extensive experiments carried on by the U. S. Bureau of Mines would appear to exonerate tetraethyl lead, when added to gasoline and used as a motor fuel, from blame as a poisonous element, but over a period of time what effect may it have on the undeveloped nervous system of infants under 1 year of age?

Children are exposed to a great deal of exhaust gas. Frequently the baby is taken riding without seeking the physician's advice. Where people live in apartments and flats, often the only means of recreation is the motor car or a bus, and excursions to the country are attended by a prolonged exposure on the way home. In apartments on main thoroughfares where traffic is heavy, children are subjected to a constant stream of diluted exhaust gas rising from the lower stories through the building for a considerable part of the day.

The poisonous effect of exhaust gases on infants and children is difficult to estimate because of the multiplicity of factors involved, but prolonged observation may bring substantial proof. In view of the fact that chronic poisoning has been ob-

served in adults, there seems no reason why it may not be a factor in the ill health of children. This probability has influenced the writer in submitting his views, even though he has not presented definite proof, in the hope that wider interest may be awakened in this problem.

REFERENCES

1. Henderson, Yandell; and Haggard, Howard W. Health Hazard from Automobile Exhaust Gas in City Streets, Garages and Repair Shops. *J. A. M. A.*, 81:385 (Aug. 4), 1923.

2. Shumway, Ed. A. Chronic Carbon Monoxide Poisoning an Increasing Danger to Municipalities from Automobile Traffic. *Med. J. & Record*, 121:657 (June 3), 1925.

3. Wilson, Elizabeth D.; Gates, Irene; Owen, Hubley R., and Dawson, Wilfred T. Street Risk of Carbon Monoxide Poisoning. *J. A. M. A.*, 86:319 (July 31), 1926.

4. Stevens, A. M. Carbon Monoxide Poisoning, Gradual Cumulative Effects in Young Children with Report of a Fatal Case. *J. A. M. A.*, 86:1201 (Apr. 17), 1926.

ODORS FROM RENDERING OFFAL

ROBERT D. MacLAURIN, PH.D.

Commissioner, Trade Wastes, Department of Public Health and Welfare, Cleveland, O.

FATS are recovered from offal by two processes; namely, the wet and dry. The wet method involves the cooking of offal with steam under pressure. The products of the reaction are fats, stick water and tankage. The tankage is pressed and dried. The stick water is concentrated in vacuum evaporators and added to tankage to increase the ammonia content of the final product which is used for fertilizer purposes. The fats are converted into soap, glycerine and fatty acids.

The dry method consists of cooking offal in a so-called "melter" in which the protein material is cooked in its own fat. The fats are extracted from the protein material by hydraulic pressure or mechanical expellers. The protein material is ground and used as poultry feed.

From the standpoint of odors, the dry melting system is simpler and requires less care, as the only odor control equipment required is a water condenser to condense the steam and volatile gases from the cooking operation. The dry method of rendering edible and inedible offal is gradually replacing the wet method. The progress in this direction will be determined by the market demand for the more valuable by-products obtained by this method. In addition, the dry method is more economical to operate.

The wet system can be conducted in such a manner that no offensive odors will arise, but much more care must be exercised than is necessary with the dry method.

The success of odor control when the wet method is employed depends entirely on processing the materials in a fresh state at every stage in the process. The offal, stick water and tankage must be processed fresh, otherwise offensive odors may arise due to putrefaction of the various products. However, if putrefaction is prevented at every stage in the operation, there are no offensive odors generated by using the wet method.

The question of satisfactory odor control in rendering offal is essentially one of efficient plant management.

It is a well known fact that it costs less money to process fresh offal than offal which has undergone putrefaction. Furthermore, the products recovered from processing fresh offal are of superior quality and therefore demand a higher price than those obtained from offal which has undergone putrefaction.

The conclusion is that it is more profitable to conduct the rendering industry free from odor than otherwise. The watchword for odorless rendering of offal is "prevention."

IMMUNIZATION WITH DIPHTHERIA TOXOID (ANATOXINE RAMON)

P. J. Moloney and C. J. Fraser

Connaught Laboratories, University of Toronto, Toronto, Can.

THE work reported in this paper has to do with two problems: namely, the dosage of diphtheria toxoid and the value of the Schick test in studies of active immunity against diphtheria.

The dosage consisted of two injections of toxoid given subcutaneously with an interval of a month between injections.*

The work of immunization was carried out on a group of girls ranging in age from 10 to 18 years. Before the administration of toxoid a Schick test was carried out on each individual and the antitoxic content of the blood serum of the majority was titrated for 1/50, 1/25 and 1/10 unit per c.c. by an animal method. Standard diluted toxin was used for the Schick test with diluted toxoid (1–20 dilution) as control. No heated toxin control was used. Previous work had shown that diluted toxoid is as effective as the heated control for determining pseudo reactors; in addition diluted toxoid serves to indicate those individuals who may react to a subcutaneous injection of toxoid. Tables I to IV give the results of Schick tests and blood sera titrations.

The numbers under "Toxin" and "Control" indicate the approximate diameter in millimeters of the area of marked reaction, read on the third day after injection. Sometimes in addition to this area of marked reaction there is an outer zone less intense in color and more diffuse.

Table I gives Schick test readings on 66 Schick positive individuals. The blood sera of 65 of these were titrated, and in every case the antitoxic content was less than 1/50 unit per c.c.

In Table II are reported the results on 18 Schick negative individuals. The blood sera of 17 were titrated; 11 of these had 1/10 or more units of antitoxin per c.c.; 5 had from a 1/15 to 1/35 and 1 less than 1/50 unit per c.c. This last result represents a discrepancy between the Schick test and the blood titration.

Table III gives the results on 28 individuals who were toxin negative but control positive. The blood sera of 24 of these were titrated. The antitoxic content of the sera of 22 was found to be 1/10 unit or more per c.c., 1 was 1/15 and 1, 1/25.

In Table IV are the results for 29 individuals who reacted to both toxin and toxoid control. The blood sera of 27 were titrated. Five had less than 1/50 unit per c.c., and 22 had more than 1/10. The results in Table IV show that if an individual reacts to toxin and control toxoid it is impossible to decide by the Schick test whether or not he is immune. For example, J. A. C. with less than 1/50 unit of antitoxin per c.c. gave a toxin reaction of 15 mm. and control 17 mm., whereas M. T. whose Schick reactions were quite similar—toxin 16 mm. and control 18 mm.—had an antitoxic titre of more than 1/10 unit per c.c. From the results recorded in Table IV and from similar observations on other groups we have concluded that it is impossible to judge, by the Schick test, the

* The toxoid used in this work was non-toxic for guinea pigs in 5 c.c. amounts. Guinea pigs which had received 0.5 c.c. of the toxoid were able to withstand 5 m.l.d. of diphtheria toxin a month after the toxoid injection.

TABLE I

COMPARISON OF SCHICK TEST READINGS AND ANTITOXIC TITRE OF SERA

Toxin positive—Control negative

Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum	Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum
Z.A.	16	0	<1/50	M.K.	16	0	<1/50
B.A.	17	0	<1/50	M.L.	15	0	<1/50
E.B.	14	0	<1/50	M.A.L.	12	0	<1/50
M.B.	17	0	<1/50	E.L.	18	0	<1/50
C.B.	16	0	<1/50	R.L.	15	0	<1/50
D.B.	14	0	<1/50	O.M.	17	0	<1/50
F.B.	13	0	<1/50	M.M.	16	0	<1/50
M.B.	16	0	<1/50	E.M.	21	0	<1/50
L.B.	17	0	<1/50	L.M.	16	0	<1/50
L.C.	11	0	<1/50	B.M.	11	0	<1/50
M.C.	16	0	<1/50	D.M.	11	0	<1/50
E.C.	14	0	<1/50	E.M.	13	0	<1/50
J.C.	13	0	<1/50	P.N.	14	0	<1/50
C.C.	16	0	<1/50	M.P.	28	0	<1/50
P.C.	16	0	<1/50	L.P.	8	0	<1/50
H.C.	15	0	<1/50	V.R.	18	0	<1/50
L.C.	12	0	<1/50	M.R.	16	0	<1/50
C.D.	17	0	<1/50	L.R.	14	0	<1/50
M.E.	13	0	<1/50	A.R.	11	0	<1/50
A.E.	13	0	<1/50	L.S.	16	0	<1/50
V.G.	16	0	<1/50	H.S.	9	0	<1/50
R.G.	21	0	<1/50	J.S.	25	0	<1/50
E.H.	16	0	<1/50	E.S.	15	0	<1/50
M.H.	15	0	<1/50	V.S.	12	0	<1/50
L.H.	18	0	<1/50	M.S.	19	0	<1/50
P.H.	12	0	<1/50	O.T.	13	0	<1/50
F.H.	14	0	<1/50	E.T.	13	0	
M.A.H.	16	0	<1/50	M.T.	18	0	<1/50
E.H.	16	0	<1/50	A.T.	12	0	<1/50
B.H.	16	0	<1/50	V.T.	17	0	<1/50
H.J.	16	0	<1/50	G.W.	17	0	<1/50
A.K.	14	0	<1/50	A.Y.	15	0	<1/50
H.K.	16	0	<1/50	D.Y.	15	0	<1/50

state of immunity of an individual who reacts to both Schick toxin and toxoid control. This conclusion is in accord with Kellogg's findings[1] on the Schick test.

SCHICK TEST RESULTS

The following is a summary of the Schick test results recorded in the above tables. Of the 141 individuals tested, 66 were Schick positive (Table I), and 46 were Schick negative (Tables II and III). The state of immunity of 29 (Table IV) could not be determined by the Schick test.

On the basis of the above results it was deemed advisable to immunize all in the above groups who were Schick positive or who had less than 1/50 unit antitoxin per c.c. Those who were Schick positive (Table I) were given two doses of 0.5 c.c. toxoid a month apart. The combined reactors (Table IV) who had less than 1/50 unit antitoxin per c.c. were given the doses shown in Table VI. Two and a half months after the first dose of toxoid (one and a half months after the second) all who had received the toxoid were Schick tested, and blood titrations were carried out on a limited number. Tables V and VI give the results of the Schick test and blood titrations after toxoid immunization.

The dosage of toxoid and results of immunization on individuals who were toxoid reactors are shown in Table VI. The dosage was varied according to the

TABLE II

Toxin negative—Control negative

Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum	Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum
L.B.	0	0	>1/10	H.M.	0	0	1/20
D.C.	0	0	1/35	J.O.	0	0	1/35
M.C.	0	0	>1/10	F.P.	0	0	1/20
I.C.	0	0	>1/10	D.R.	0	0	>1/10
L.D.	0	0	>1/10	D.T.	0	0	>1/10
M.D.	0	0	>1/10	M.T.	0	0	>1/10
H.H.	0	0	>1/10	M.W.	0	0	1/15
L.L.	0	0	>1/10	A.W.	0	0	1/10
T.L.	0	0		H.W.	0	0	<1/50

TABLE III

Toxin negative—Control positive

Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum	Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum
F.B.	0	13	1/10	I.L.	0	6	>1/10
D.C.	0	15	>1/10	E.M.	0	8	>1/10
V.C.	0	18	1/15	E.A.M.	0	15	
F.C.	0	23	1/25	E.G.M.	0	14	>1/10
G.D.	0	18		F.M.	0	20	>1/10
I.D.	0	14	>1/10	E.O.	0	8	>1/10
L.E.	0	11	>1/10	L.O.	0	8	>1/10
L.H.	0	10	>1/10	M.P.	0	23	>1/10
M.H.	0	18	>1/10	P.R.	0	15	
A.L.	0	25	>1/10	D.S.	0	12	>1/10
P.L.	0	12	>1/10	L.S.	0	13	>1/10
R.F.	0	23	>1/10	H.V.	0	10	>1/10
C.H.	0	25	>1/10	C.V.	0	10	>1/10
K.H.	0	26	>1/10	B.W.	0	40	

size and intensity of the original toxoid control reaction. The 6 individuals listed became immune following the toxoid injections. Table V gives the results of immunization on 54 individuals who were non-reactors to toxoid. Of these, 35 became Schick negative; 15 remained Schick positive; and 4 reacted to both toxin and control. As already pointed out, the state of immunity of these last 4 could not be determined by the Schick test. Blood titrations showed that 2 were immune, 1 was not immune and on 1 no blood titration was done. These results show that approximately 70 per cent of those who received the toxoid had become immune. A Schick test was again carried out after three months. The results of this Schick test were substantially the same as in the previous test. One girl (B. M.) previously Schick positive had become Schick negative and 5 had become toxoid sensitive: *i.e.*, reacted to the toxoid control.

SUMMARY

Our conclusions regarding the Schick test refer to a Schick test in which diluted diphtheria toxoid is substituted for heated toxin control.

1. If an individual reacts to both Schick toxin and toxoid control, no conclusion can be drawn regarding his state of immunity to diphtheria. At present the only method for determining the state of immunity of such an individual is an antitoxic titration of his blood serum.

2. A negative Schick reaction (negative toxin reaction) may be taken as presumptive evidence of immunity to diphtheria, but not as a guarantee of immunity.

3. In the work reported, the correlation between the Schick tests and the blood serum titrations have been extremely good. Hence, we have concluded that the Schick test is of value in studies of active immunity.

Seventy per cent of the individuals who received two doses of toxoid, 0.5 c.c. each, with an interval of a month between injections, became immune. While the number on which this percentage is based is too small to permit a final conclusion, nevertheless we think our results are sig-

TABLE IV

Toxin positive—Control positive

Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum	Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum
V.A.	13	10	>1/10	D.H.	10	32	>1/10
W.B.	16	8	>1/10	L.H.	7	17	<1/50
J.C.	11	11		S.H.	11	36	>1/10
J.A.C.	15	17	<1/50	M.H.	22	27	<1/50
C.C.	15	5		B.K.	10	11	>1/10
M.C.	7	15	>1/10	G.L.	6	10	>1/10
B.D.	6	24	>1/10	E.M.	11	16	>1/10
M.D.	10	40	>1/10	G.M.	6	6	>1/10
D.F.	15	11	>1/10	G.P.	8	14	<1/50
E.D.	10	14	>1/10	L.P.	7	9	>1/10
D.E.	14	6	<1/50	M.T.	16	18	>1/10
M.E.	10	12	>1/10	R.T.	6	12	>1/10
L.F.	10	12	>1/10	E.T.	8	19	>1/10
E.G.	10	10	>1/10	M.W.	12	12	>1/10
H.G.	14	23	>1/10				

TABLE V

SCHICK TESTS AND BLOOD SERUM TITRATIONS AFTER IMMUNIZATION

Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum	Name	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum
Z.A.	15	0	<1/50	M.A.L.	0	0	
B.A.	11	0	<1/50	E.L.	0	0	
M.B.	0	0		M.M.	0	0	
C.B.	0	0		E.M.	0	0	>1/2
D.B.	0	0		L.M.	0	0	
F.B.	10	0	<1/50	B.M.	0	0	
M.B.	0	0		E.M.	0	0	
M.C.	7	0		P.N.	6	13	<1/50
J.C.	0	0		M.P.	0	0	
C.C.	0	0		V.R.	10	0	<1/50
P.C.	6	0	<1/50	M.R.	0	0	
H.C.	0	0		L.R.	0	0	
L.C.	3	3	<1/50	A.R.	21	5	
C.D.	0	0		L.S.	12	0	
V.G.	0	0		H.S.	0	0	
R.G.	0	0	1/25–1/5	I.S.	13	0	<1/50
E.H.	0	8		E.S.	0	0	
M.H.	0	0		V.S.	0	0	
F.H.	10	0	<1/50	M.S.	0	8	1/25
M.A.H.	15	9	>1/10	E.T.	0	0	
E.H.	10	0		M.T.	0	0	
B.H.	0	0		A.T.	10	18	>1/10
H.J.	15	0	<1/50	V.T.	0	0	1/5
H.K.	10	0	<1/50	G.W.	13	0	<1/50
M.K.	0	0		A.Y.	0	0	
A.K.	11	0	<1/50	D.Y.	0	0	
M.L.	0	0					

TABLE VI

RESULS OF IMMUNIZATION OF TOXOID REACTORS

Name	Toxoid Dosage 1st Dose	2d Dose	Schick Readings (Diam. in mm.) Toxin	Control	Units Antitoxin per c.c. Serum
J.C.	0.1 c.c.	0.1 c.c.	3	18	1/5
C.C.	0.05 c.c.	0.05 c.c.	15	8	>1/10
D.E.	0.5 c.c.	0.5 c.c.	0	0	
L.H.	0.25 c.c.	0.25 c.c.	7	7	>1/10
M.H.	0.05 c.c.	0.05 c.c.	0	26	
G.P.	0.05 c.c.	0.05 c.c.	0	0	>1/10

nificant, particularly in view of the fact that they are in agreement with those of other workers.[2, 3] In future work on active immunization against diphtheria, we hope to study the effect of three doses of toxoid. In this connection it is of interest to note that Roubinovitch, Loiseau, and Laffaille,[3] using three doses of toxoid, state that they have successfully immunized 98 per cent of those treated.

REFERENCES

1. Kellogg. *A. J. P. H.*, 15:868, 1925.
2. Bloomberg and Fleming. *Canad. M. A. J.*, 17:801 (July), 1927.
3. Martin and Loiseau. *J. Med. Français*, 15:401, 1921.

USE OF A DIFFERENTIAL STAIN IN THE DIRECT ENUMERATION OF BACTERIA IN PASTEURIZED MILK

MARGARET BEATTIE

Assistant Professor of Public Health, University of California, Berkeley, Calif.

THE FIRST to use the microscope for the direct enumeration of body cells and later bacteria in milk were Breed and Brew (1916) of the New York Agricultural Experiment Station. Since the publication of their method, many experimenters have repeated the work and endeavored to reconcile the counts of milk obtained by the direct method with those obtained by the plating method. The fourth edition of the *Standard Methods of Milk Analysis* of the American Public Health Association describes a method of reconciliation in which the plate count is assumed to indicate one-quarter of the number of bacteria present by actual count (except for the poorest grades of milk).

The advantages of the direct microscopic method are many:

1. The actual number of organisms in milk can be estimated, whereas the plate count shows only the number of group organisms of certain types capable of growth on standard media.
2. The microscopic count reveals the actual kinds of organisms present.
3. The microscopic count is more accurate.
4. The process is very simple and does not involve the use of media or glassware.
5. The count can be made quickly—even before the milk is prepared and delivered.
6. The slides with the stained milk film can be kept for reference.
7. The films can be made, fixed and sent to the laboratory for staining and counting so that no matter how great the distance between the dairy and the laboratory, the sample is still representative of the milk at the time of sampling. To quote from *Standard Methods for Milk Analysis*, 4th edition: "As it is only in this way that counts of the bacteria themselves can be made, it must be recognized that accurately carried out microscopic counts of individual bacteria give the truest picture of actual conditions of raw milk that can be obtained with any technic."

The direct microscopic count has certain limitations:

1. All milk standards are at present based upon the plate count and no reconciliation of the two counts has been generally accepted.
2. The count is considered inaccurate by some authorities because such a small quantity of milk is used.
3. The method cannot be applied to pasteurized milk since the methylene blue would stain the dead organisms in addition to those remaining alive at the end of the pasteurizing process.

In order, then, to make the methods applicable to pasteurized milk it would be necessary to use a stain which would differentiate between the living and dead organisms. The following study was made in order to determine the applicability of Proca's stain as a substitute for methylene blue in the above method.

Proca (1909) noted:

Dead bacteria, stained previously by Loeffler's blue, lose the blue color and become red under the influence of a 10 per cent solution of carbol-fuchsin poured rapidly over the preparation. Treated by the same process, the bacteria of a living culture do not give up the blue dye which they have fixed. The variable cyanophilia of bacteria, corresponding to their vitality, appears in a more certain manner if the following mixture is used to stain preparations fixed by moderate heat:

Concentrated fuchsin (Ziehl)	8 c.c.
Distilled water	100 c.c.
Loeffler's	100 c.c.

The coloring mixture ought to remain at least 24 hours exposed to the air before being used. It is sufficient to stain during one minute and to wash in water in order for the differential color to appear: blue for the living bacteria and red for those which are dead.

Kayser (1912) used Proca's differential staining method and reported that he secured the best results with thin smears air dried and gently warmed. The methylene blue was used first, followed by two applications of the carbol-fuchsin.

In order to confirm the statement of Proca a number of organisms such as *B. coli*, a Gram positive staphylococcus, *B. subtilis*, and *B. bulgaricus* were grown in broth and on agar. Some of the cultures were sterilized, some were pasteurized and others served as living controls. Smears from these cultures stained by a mixture of Loeffler's methylene blue and carbol-fuchsin showed definite differentiation between dead and living organisms. Occasional red stained or dead organisms were seen in living cultures, particularly when these were old, but these were so few that they could be considered as individuals which had died in the culture. Mixed cultures of killed and living organisms showed the differentiation very clearly.

Having confirmed Proca's claim that the stain differentiates between living and dead organisms, the next step was the application of the stain to milk smears. The direct count of milk involves the use of a fat solvent and a fixative. In applying the differential staining method to pasteurized milk, a solvent and a fixative which would not change the reaction of the organisms to the differential stain were necessary. A number of different solvents and fixatives were tried and it was finally determined that the use of ether as a solvent and alcohol as a fixative did not change the reaction of the organisms to the stain. It was found that in thin smears of milk, seeded with living organisms, these bacteria were stained a clear blue against a bright red background. In smears from cultures seeded with dead organisms these bacteria stained red but were not easily differentiated against the red background. It was at once seen that this contrast would be of great advantage when the stain was applied to pasteurized milk. The blue living organisms would easily be counted, while the dead organisms would blend with the red background.

When the stain was applied to smears of milk made according to the original method of Breed and Brew, it was found that the background remained a deep blue and that enumeration of the bacteria was impossible. Diluting the stain was not successful because this procedure reduced the concentration of the already very dilute carbol-fuchsin. Increasing the proportion of carbol-fuchsin in the stain failed to give good results. It was finally determined that thin smears were necessary, and 0.01 c.c. of milk was spread over an area of 4 sq. cm. instead of over 1 sq. cm. as advocated by Breed and Brew. This film treated with the differential stain gave a bright red background against which the blue organisms showed clearly. Seeded milk showed that the stain differentiated successfully between living and killed organisms in such smears.

METHOD

The following method for making microscopic counts of pasteurized milk was finally adopted:

Glass slides ruled with two squares of 4 sq. cm. each were placed on the frame of an electric stove. The stove was leveled and freshly cleaned glass slides placed over the ruled slides. A 1/100 c.c. milk pipette (Bausch and Lomb) was washed in cleaning fluid (sulphuric acid and potassium dichromate), rinsed twice in fresh water and rinsed out with the milk sample. The rinsing water was in test tubes and a separate tube of water was used at each rinsing. The sample of

milk was spread over the area marked on the slide by a stiff needle set in a metal handle. The needle was flamed between samples. The films were allowed to air dry but if longer than 10 minutes was required for the process it was assisted by gentle heat from the stove. The dried films were immersed for 20 minutes in a mixture of equal parts of ether and alcohol. The films were then air dried and immersed from 1 to 3 minutes in a mixture of 8 c.c. concentrated carbol-fuchsin with 100 c.c. Loeffler's methylene blue. This stain differs from Proca's in that the 100 c.c. of distilled water is omitted from the mixture.

The dried, stained smears were examined under the microscope by artificial light with a blue glass below the condenser. A 170 mm. tube length, oil immersion lens and No. 5 ocular gave a factor of 1,200,000. For each sample of milk 300 fields were counted, the sum of the organisms in these multiplied by 4,000 gave the number of organisms per c.c. Counts of the individuals and the groups of bacteria were made.

Several duplicate smears of pasteurized milk were made and stained with Proca's stain and with methylene blue stain. Smears of 31 samples of pasteurized milk stained by Proca's stain were examined. Plate counts of the same samples were made at the Health Department Laboratory in Berkeley by H. J. Sears, City Bacteriologist (Table I).

In order to determine the degree of relationship between the direct group count and the standard plate count, the data in Table I were submitted to Eschscholtzia L. Lucia, Associate in Public Health Administration in this department, for statistical study. Mrs. Lucia made the following report:

The data submitted were correlated by the Pearson formula and showed a positive relationship of .4012±.1016 which indicates a substantial degree of association. The mean of the direct group count was 89,450±9,360 while the mean of the plate count was 63,387±12,226. The standard deviation of the former was 77,310±6,620; of the latter 100,961±8,652. This gives coefficients of variation of 86.43 and 159.28 respectively.

It is at once evident that all these results are reliable in that each exceeds its probable error multiplied by 3.

TABLE I

COMPARATIVE COUNTS OF 31 SAMPLES OF PASTEURIZED MILK

Direct Count of Individual Organisms	Direct Count of Groups of Organisms	Plate Count
122,000	16,000	8,300
312,000	60,000	5,500
84,000	40,000	200
328,000	52,000	200
564,000	90,000	1,400
96,000	12,000	1,200
648,000	99,000	1,300
108,000	12,000	15,000
48,000	12,000	9,700
980,000	160,000	250,000
572,000	128,000	300,000
627,000	88,000	300,000
432,000	56,000	3,900
293,000	52,000	5,900
336,000	22,000	4,100
932,000	132,000	15,000
570,000	116,000	30,000
1,452,000	396,000	100,000
1,440,000	176,000	50,000
1,308,000	232,000	100,000
452,000	80,000	20,000
384,000	60,000	3,700
312,000	72,000	40,000
16,000	12,000	800
880,000	120,000	320,000
316,000	52,000	580
1,500,000	130,000	250,000
560,000	36,000	15,000
208,000	48,000	1,250
1,624,000	144,000	72,000
312,000	68,000	40,000

The coefficient of variation in the direct group count is considerably less than that of the plate count, which indicates that the former method of counting produces more consistent results.

The number of comparative counts is small, but it represents a group of random samples of the pasteurized milk supply of a city. It would be interesting to see if these statistical results held in a larger series.

CONCLUSIONS

1. Proca's stain differentiates between living and dead bacteria.

2. With thin smears a direct enumeration of bacteria in milk is possible.

3. Proca's stain gives a lower count with pasteurized milk than does methylene blue since the latter does not differentiate between living and dead organisms.

4. A comparison of plate counts of 31 samples of pasteurized milk with direct

group counts of the same samples shows that the variation in the direct counts is much less than the variation in the plate counts. There is, however, a substantial positive correlation between the two methods.

BIBLIOGRAPHY

Breed, R. S., and Brew, J. D. Counting Bacteria by Means of the Microscope. New York Agri. Exp. Sta. *Bull. 49*, 1916.

Kayser, H. Die Unterscheidung von lebenden und toten Bakterien durch die Faerbung. *Centralbl. f. Bakteriol.*, 62, 174–176, 1912.

Proca, G. Sur une coloration différentielle des bactéries mortes. *Compt. rend. Soc. de biol.*, 67, 148–149, 1909.

SOME SUGGESTIONS REGARDING THE STANDARD METHODS OF MILK ANALYSIS

C. S. MUDGE

Associate Professor of Dairy Industry, University of California, Davis, Calif.

IN the report of the Referee for the Bacteriological Examination of Milk [1] based on the questionnaire sent to the various laboratories throughout the country, many interesting facts were brought out. From a study of this report one is apt to wonder if there really is such a thing as "standard methods" when it was disclosed that agar was used in quantities varying from 10 to 30 g. per liter; peptone (8 brands) in quantities from 5 to 20 g. per liter; extract (2 brands) in quantities from 3 to 10 g. It needs no mathematician to calculate the possible number of "Standard Media" used throughout the country. The fact that there are so many attempts made to vary the standard, indicates that there is dissatisfaction among the users of the medium. There seems to be no such similar difficulty among the water analysts. Within the last year many attacks upon the medium have been made, and yet the thinking man knows that fundamentally the method is correct and should be saved from destructive criticism.

For a number of years the writer has in his own laboratory, in studies on the bacteria of milk, used methods other than the standard. For control work, "Standard" procedure was followed as a matter of course. However, he has felt the need of a few changes which might seem at first blush to be fundamental and vastly upsetting to established practices. In recent months, following some rather vicious attacks upon the Standard Methods, it has occurred to him that perhaps some of these thoughts might well be spread upon the printed page, if solely for the purpose of initiating a discussion, which the present methods could well afford. There are variations in the agar plate count—that we know. Conditions have changed greatly since the early days of Koch—since the early days of the present century, in fact.

We no longer have such wide differences between the various grades of milk, thus the plate method has to differentiate between milks much closer in grade. The medium is subjected to a greater test today than ever before; so if we can by some means strengthen the method, let us do it.

METHODS FORMULATED

When, in 1895, the American Public Health Association appointed a committee to formulate methods for conducting bacteriological and chemical analyses of water, a most important step was taken. These methods and this medium, subjected now to numerous changes, have fulfilled the fondest hopes of their sponsors. These methods were devised for public health officials particularly interested in the bacteria found in water.

Within the Association there were also those who saw a similar need for the standardization of methods to be used in the enumeration of bacteria in milk. Therefore, in 1910 there appeared the first edition of *Standard Methods for the Bacteriological Examination of Milk*. In this first edition, as indeed in all subsequent editions, the medium selected was similar to that used for water analysis. In bacteriological water analysis the main thought is to determine the extent of probable fecal contamination through the enumeration of the members of the colon group. Organisms of the colon group are of great importance in formulating our ideas concerning the safety of a water supply. This is true now and always will be true. The presence of colon organisms is a sanitary index of the water in which they are found. Colon organisms grow well in most media; especially is this true of the medium specified as "Standard." There are no difficulties facing the water analyst such as face the milk analyst; *their* medium satisfies *their* needs.

MILK AND WATER COUNTS VARY IN SIGNIFICANCE

Can this be said of the medium as applied to the enumeration of bacteria in milk? Of course, in milk, as in water, we have the colon group present. The significance of these organisms is, however, not so great. A water with 200–500 per c.c. colon organisms would never be considered safe, yet even good milk has as many. It is due to the conditions peculiar to the gathering of milk. They cannot be entirely kept out. More numerous and more important, at least to the milk student, are the "typical" lactic bacteria, streptococci for the most part. They are numerous in milk and certainly characteristic. These organisms require a richer medium or perhaps merely a more available source of carbon. This frequently makes an organism of this type either just grow or just not grow, giving rise to the annoying type of colony, the so-called "pin-point" colony. This is particularly true in the case of pasteurized milk, since it is a well known fact that there is a larger proportion of the lactic streptococci in pasteurized milk. Carbohydrates, particularly lactose, markedly increase the size of the colonies, as was pointed out by Sherman,[2] Ayers and Mudge,[3] and Supplee, Whiting and Downs.[4]

In the Fourth Edition of *Standard Methods of Milk Analysis*[5] particular emphasis is placed on the statement that these facts are true concerning the addition of fortifying substances: that they can and do increase the number of colonies on the plates. It is qualified with the further suggestion that "the expense of such procedures in time or in materials would greatly reduce the number of analyses that a routine laboratory could make," and that "the results secured by the agar plate technic . . . give a sufficiently accurate proportional fraction of the true count to be of value in milk control." All this is quite true; with the exception of the cost element. The standard medium does give reasonably accurate comparative results. The argument made here for the change of medium for milk analysis is not based on the ability of a fortified medium to give higher counts, but on the more rational argument that a fortified medium is the logical one because of the peculiar characteristics of the organisms found in milk. The point is sometimes made that such fortified media would cause a chaotic condition in the control laboratories since milk falling into one grade would be placed in the next lower. On second thought this would not follow. The admittedly higher count would be of the same *magnitude* as those of the standard mediums. It is the size of the colony and the ease of counting which is of greater value to the analyst. Low count milk and certified milk do not seem to respond so well to such added substances, but milk with larger numbers of bacteria does.

There are two ways by which the standard medium could be fortified, either by the addition of lactose (.5 per cent) or milk powder (.5 per cent). Either makes a medium which is more suited to the bacteria found in milk. The milk agar, it might be pointed out, not only gives colonies larger than those upon standard medium, but also permits of a qualitative interpretation, since acid formers and peptonizers are easily distinguished. It is further suggested that instead of saying "Bacto Peptone, or some other brand giving comparable results" that some definite basis for comparison be designated, such as the Biuret test, the Van Slyke or Sörensen values of the amino nitrogen, etc. The present method of certification of stains might offer a splendid precedent.

INCUBATION

The temperature of incubation is also a point of difference between the established practice—practice borrowed from medical bacteriology, and sound judgment. In water work there can be no quarrel with the temperature or the time, since intestinal bacteria are of paramount importance. In milk, let it be repeated, this is not true to such a large extent. It is therefore suggested that the incubation factors be 30° C. for 48 hours. These factors will give a larger colony, it will obviate largely the difficulties arising from plates contaminated with spreaders and again seems to be the more logical temperature because the optimum temperature of growth of milk bacteria seems to be around 30° C. The counts are slightly higher at 30° C. than at 37.5° C.

MARKING PLATES

It is further suggested that plates be marked with the dilution in some manner other than that used at present. It is so easy to read a cipher more or less, especially when there are five or six, such as in the number 1–100,000. The method suggested is as follows:

1/100	H(undred)	C (Roman numeral)
1/1,000	T(housand)	M
1/10,000	O T	XM
1/100,000	OO T	CM
1/1,000,000	M(illion)	MM

This, it is believed, would obviate confusion in reading the dilution. It may not be worthy of incorporation in the report and yet experience among students has shown the wisdom of the plan.

MODIFICATION OF PRESENT STANDARDS

The statements made above are true, but they are not new. They are a matter of common knowledge to workers in the dairy field. Heretofore no use has been made of these facts in work of a routine nature, yet the use of the suggested medium and incubation factors would tend to ameliorate some of the difficulties confronting the dairy bacteriologist. If but two or three laboratories were concerned, little attention would be drawn to the subject. The whole country, however, is affected, the whole structure of dairy control is seriously menaced by lack of confidence in the Standard Method, but I find it possible to believe that a slight modification in the present methods would go a long way to solve the problems before us.

REFERENCES

1. Standard Methods of Milk Analysis, Bacteriological Methods. (Report of Referee.) *A. J. P. H.*, 16:811 (Aug.), 1926.

2. Sherman, J. M. Advantages of a Carbohydrate Medium in the Routine Bacteriological Examination of Milk. *J. Bact.*, I:481, 1916.

3. Ayers, S. H., and Mudge, C. S. Milk Powder Agar for the Determination of Bacteria in Milk. *J. Bact.*, V:565, 1920.

4. Supplee, G. C., Whiting, W. A., and Downs, P. A. Variations in Bacteria Counts from Milk as Effected by Media and Incubation Temperatures. Cornell University, *Agri. Exp. Memoir*, 43:221, 1921.

5. Standard Methods of Milk Analysis. American Public Health Assn., 1923, 40 pp.

PUBLIC HEALTH ASPECTS OF TUBERCULOSIS AND HEART DISEASE

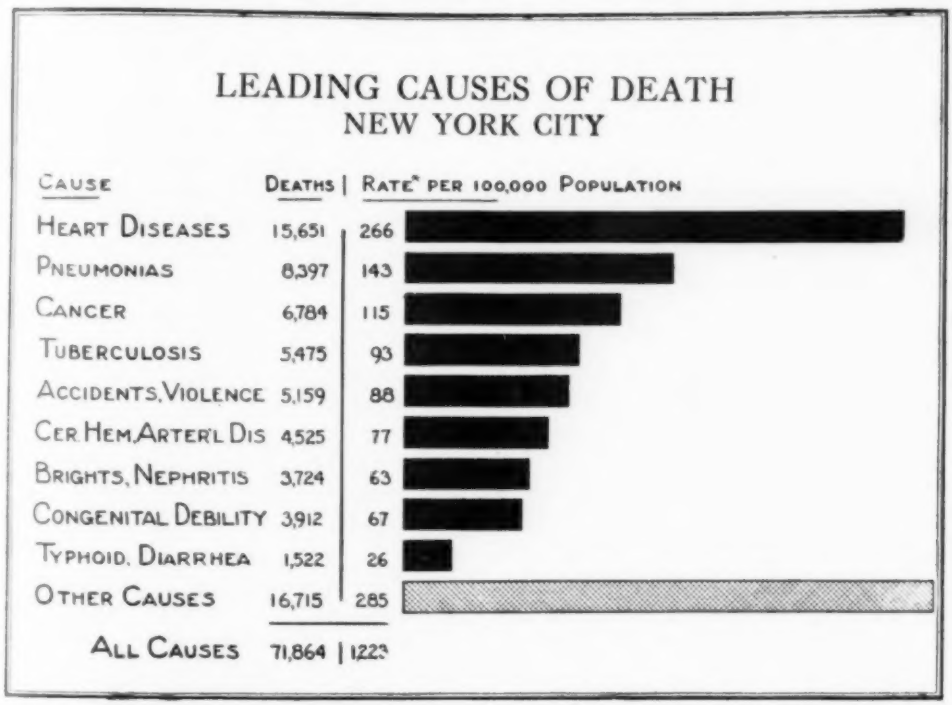
IAGO GALDSTON, M.D.

Secretary, Health Education Service, New York Tuberculosis and Health Association; Professor of Public and Social Health, School of Sociology and Social Service, Fordham University, New York, N. Y.

PUBLIC HEALTH organizations, official and private, are obliged to face their problems and meet their numerous obligations on a solid business basis. Of the various health problems demanding their attention they cannot always elect the theoretically "most important," but often must take up the ones promising the greatest immediate and substantial returns. With resources limited, and with the demands upon their finances, personnel, etc., far in excess of their total capacities, public health organizations must discriminate keenly in the selection of the public health problems which they are to tackle. More than that, they must apportion their resources in accordance with some perhaps arbitrary but nevertheless definite conception as to relative importance of the problems tackled.

To facilitate such an evaluation a "comparison" is herein undertaken, of the public health aspects of tuberculosis and those of heart disease. Needless to

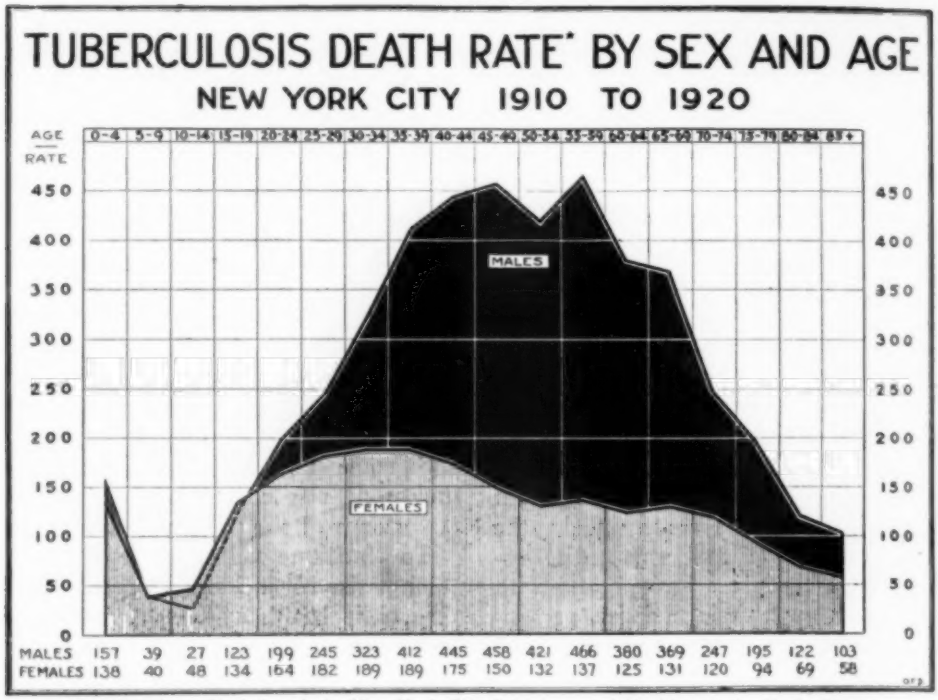
CHART I



Figures by courtesy of Bureau of Records, New York City Department of Health

* Based on 1925 State Census.

CHART II



Compiled from Statistics of the New York City Department of Health and the U. S. Census

* Death rate from all forms of tuberculosis per 100,000 persons living at each specified age period.

say, this comparison cannot in any way bring out the ultimate relative significance of the two causes of mortality. But it is readily conceivable that such a study may serve to bring out the relative importance of factors common to both, and these in turn may guide those of us concerned both with heart disease and tuberculosis in shaping our programs. (See Chart I.)

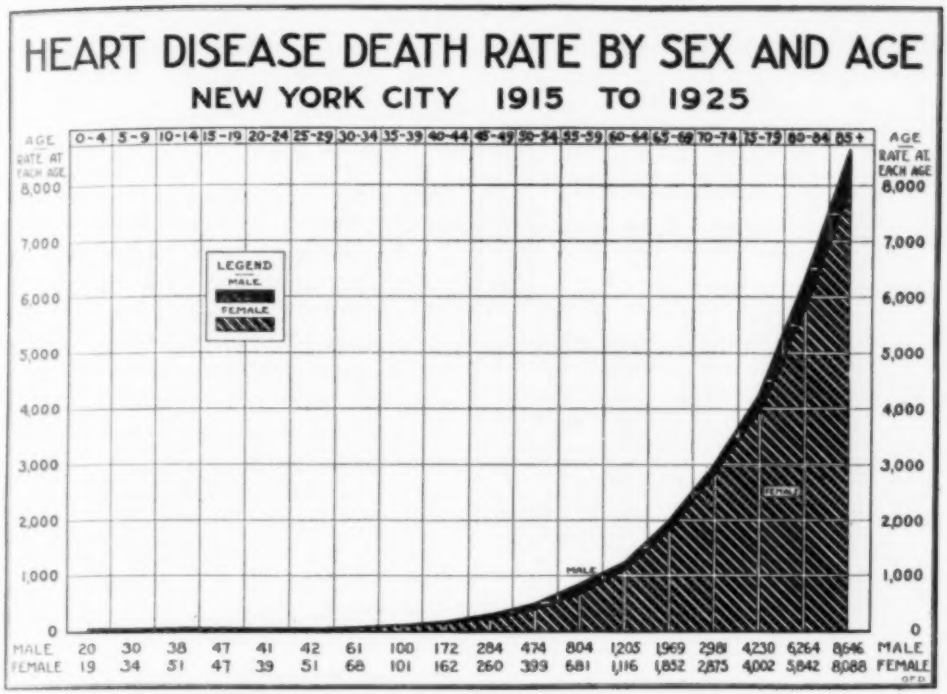
In 1926, in the city of New York, tuberculosis stood fourth in the list of leading causes of death—heart disease, the pneumonias and cancer leading tuberculosis in the order named. The Great White Plague, therefore, has seemingly been robbed of its "greatness," having to all appearances been dislodged by the pneumonias, the diseases of the circulatory system, and by neoplasms.

THE REAL STATUS OF TUBERCULOSIS

At this time it appears highly desirable to critically examine the real status of tuberculosis, and to set its true measure against the other causes of mortality now tending to crowd it into the background of the public health picture. Such a critical review is particularly timely and pertinent in the light of the extension in the fields of operation undertaken by many anti-tuberculosis societies.

While heart disease, the pneumonias and cancer lead tuberculosis as causes of death, tuberculosis really faces the "competition" of only heart disease. Both cancer and the pneumonias are sufficiently different in etiology and pathologic essentials to be "out of the running." Heart disease, on the other hand, for reasons not readily evident, is considered akin to tuberculosis. On most factors these two causes of mortality are not comparable, and it would profit little to set them off against each other in a hypothetical measurement of relative importance. From a practical viewpoint, however, there is

CHART III



From Reports, Bureau of Records, New York City Department of Health

Death rate from heart diseases per 100,000 living in each age group, decade 1915–1924, inclusive (1921 International List Nos. 87–90).

much to be gained by a detailed analysis and comparison of certain of the involved and comparable items.

COMPARATIVE STATISTICS

In 1926, in the city of New York heart disease was responsible for the death of 16,460 individuals, and tuberculosis killed 5,508. Heart disease, therefore, killed approximately three times as many persons as did tuberculosis, the mortality rates per 100,000 population being, heart disease 278, and tuberculosis 93.

The true significance of these figures can, however, be better determined by a detailed study of the mortalities for the various age and sex groups. Herein we find marked and significant differences between tuberculosis and heart disease deaths. (See Charts II and III.)

Chart II shows the tuberculous mortality rate for male and for female, at different ages, for the years 1910 to 1920. Chart III gives similar data for heart disease during the years 1915 to 1925. While the periods are not identical, the age groupings are, and these charts can, in a crude way, serve our purpose. At once it is seen that the peak of tuberculosis death rate (male) is reached at 35 years of age and is sustained between the ages of 35 and 50, while the peak of cardiac death rate is reached only at the age of 85.

Comparing the death rates per 100,000 male population (during the age periods from 35 to 60) both for tuberculosis and heart disease, results in Table I.

TABLE I

COMPARATIVE DEATH RATES—TUBERCULOSIS AND HEART DISEASE—MALES

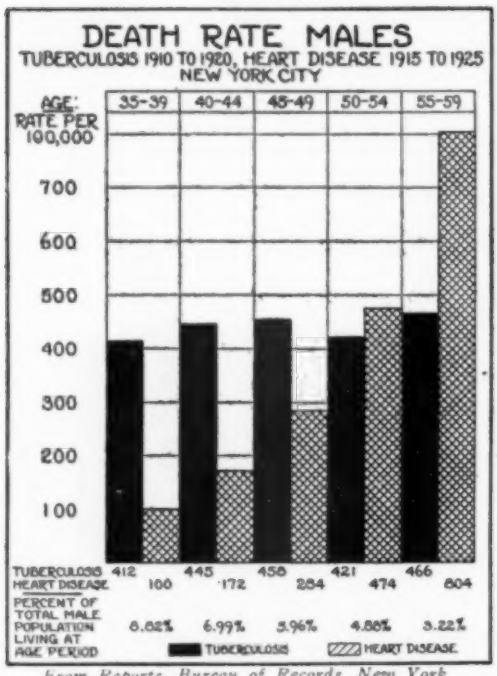
By Age Periods 35 to 59

Tuberculosis 1910–1920
Heart Disease 1915–1925

Age Period	35–39	40–44	45–49	50–54	55–59
Tuberculosis	412	445	458	421	466
Heart Disease	100	172	284	474	804

(See Chart IV)

CHART IV



From Reports, Bureau of Records, New York City Department of Health

It is evident here that for males tuberculosis, judged for the present only from the angle of mortality, represents a larger and more urgent problem than heart disease. This becomes more evident when we consider the percentage of the total population living during the age periods considered.

TABLE II

CITY OF NEW YORK

Per Cents of Population by Sex and Age
U. S. Census, January 1, 1920

Age	Female	Male
35–39	8.06	8.82
40–44	6.51	6.99
45–49	5.39	5.96
50–54	4.64	4.85
55–59	3.16	3.22

It is a matter of simple arithmetic to calculate the relative magnitude of a death rate of 412 per 100,000 population (*tuberculosis at age 35–39*) affecting 8.8 per cent of the total male population and a death rate of 804 per 100,000 (*heart disease at age 55–59*) affecting 3.2 per cent of the total male population.

Emphasis in this consideration has thus far been placed on the male sex. From the graphs and tables given herein, it is easy to make a like analysis of the comparative death rates of females from tuberculosis and heart disease. The death rates from heart disease differ but little for male and female in the various age groups. In tuberculosis for the age periods considered (35 to 59) the death rate for males is from two to three times as high as for females.

The public health significance and social implications of these differences in the mortality rates from tuberculosis and heart disease is not hard to discover, nor too complicated for ready appreciation.

In the periods of maturity when the social investment in, and value of, the individual is at its maximum, when the social responsibilities of the individual as father, husband, worker and citizen, are greatest, the community loses more of its men by death due to tuberculosis than from heart disease. The consequences following are numerous. The death of the father commonly tends to reduce the family to the level of poverty and dependence, and burdens the mother and children, rendering them more prone to the development of diseases in general and to active tuberculosis in particular.

This of course is true both where the death of the father is due to tuberculosis or to heart disease; numerically, however, more men die of tuberculosis at an age when they have dependent families.

An indirect substantiation of the validity of the above contention may be found in recent reports of the A.I.C.P. of the city of New York. Contrasting the number and percentage of families in need of assistance because of tuberculosis or heart disease, we find, as shown in Tables III and IV, that tuberculosis predominates as a cause of dependency.

TABLE III

	1923	1924	1925	1926
Number of tuberculous families under care	602	754	790	734
Per cent of total	11.7	13.2	11.6	12.6
Number of cardiac families under care	271	336	456	523
Per cent of total	5.3	5.9	6.7	9.0

Further significance is lent the figures in Table III by an analysis of the age of

the cardiac and tuberculous patients, as shown in Table IV.

TABLE IV

Number of tuberculous patients		786
Adults	594	
Children	192	
Number of cardiac patients		620
Adults	286	
Children	334	

Public health is deeply concerned with disease prevention. It is logical, therefore, at this point to attempt contrasting heart disease and tuberculosis on this score. This attempt at once brings to the fore an inherent incongruity. Heart disease, save as a mortality cause, is really in no fundamental way comparable to tuberculosis. Heart disease is the resultant of the operations of a number of pathogenic causes. Tuberculosis is a disease the immediate cause of which is a known microorganism: the tubercle bacillus. One might compare heart disease, and the diseases of the respiratory system; or, more pointedly, some one single known cause of heart disease like lues, with tuberculosis. But heart disease as commonly understood, is not comparable to tuberculosis.

Granting all the aforesaid, for practical purposes we may with some profit compare that which is known and practiced in the prevention of tuberculosis and of heart disease. While there is no known specific method for the prevention of either, the field of preventive endeavors is wider and better known in tuberculosis than in heart disease. Furthermore, much that is advocated in the prevention of heart disease has been and is a part of the tuberculosis prevention program.

CONCLUSIONS

The conclusions to be drawn from the above considerations appear self-evident. Heart disease is a public health problem of the first magnitude. It is not, however, as some contend, "The Outstanding Health Problem." It does not overshadow tuberculosis. In so far as heart disease is preventable, its prevention is extensively promoted by the broad disease prevention campaigns of the antituberculosis movement. Little gain is promised either in the progress of tuberculosis mortality or heart disease mortality reduction by a shifting of efforts and expenditures from the field of tuberculosis prevention to that of heart disease.

NEW STEP IN INTERNATIONAL RELATIONS OF PHYSICIANS

The cordial relations of the physicians of America, North and South, and their colleagues of the Old World were further expressed by the appointment of American representatives to the editorial cabinet of the *Acta Dermato-Venercologica* published under the direction of Dr. Johan Almkvist of Stockholm, Sweden. The nominees are: Howard Morrow of San Francisco, Howard Fox of New York, J. B. Shelmire of Dallas, D. R. Smith of Toronto, Pardo Castello of Havana, and Herman Goodman of New York.

The Acta Dermato-Venercologica publishes original contributions in French, German, or English within the fields of dermatology, urology, and social hygiene, and items of interest of persons or progress in these specialties.

American literary contributions should be addressed to Dr. Herman Goodman, 18 East 89th Street, New York, N. Y.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

EDITORIAL COMMITTEE

MAZYCK P. RAVENEL, *Chairman* HOMER N. CALVER, *Managing Editor*

C. C. YOUNG, LOUIS I. DUBLIN, PH.D., E. R. HAYHURST, M.D., MERRILL E. CHAMPION, M.D., ARTHUR P. MILLER, C.E., HENRY F. VAUGHN, D.P.H., JAMES A. TOBEY, LL.B., DR.P.H., EVART G. ROUTZAHN, C.-E. A. WINSLOW, DR.P.H., WALTER S. FRISBIE, SOPHIE C. NELSON, R.N.

THE PREVENTION OF SYPHILIS BY THE STATE

AN interesting question has been raised by Dr. George H. Bigelow, Commissioner of Health for the State of Massachusetts. In a letter to *The Independent*, Dr. Bigelow asked for opinion "as to what should be the attitude of official health agencies toward the prophylaxis of venereal diseases should an effective method be presented." In further explanation of his attitude and in answer to an editorial in the *Boston Medical and Surgical Journal*,[1] he takes typhoid fever as an example, showing that among other methods of control immunization by vaccine is employed. Recognizing that the venereal diseases are among the most widespread of all ailments, he compares our measures in combating them to those employed against typhoid fever, and asks why individual prophylaxis should not be employed just as preventive inoculations are employed for typhoid fever. He very properly says that practically all official health organizations are "at least going through some sort of motions" in regard to other controls but neglect the fourth method, individual prophylaxis.

The editorial in the *Boston Medical and Surgical Journal* takes Dr. Bigelow rather sharply to task, and in its argument goes as far as what seems to us the *reductio ad absurdum*. It even suggests that the syphilitic should be put under the same individual control as is exercised over the leper. Dr. Bigelow replies: "Of all barbarities, our methods of leper handling are perhaps the most flagrant." Certainly there has been, and probably now is, more hysteria over leprosy than any other disease of which we know, and it has resulted in extreme and irrational cruelties in many cases.

In the discussion the experience with prophylaxis during the World War comes under scrutiny. It is perfectly true that the degree of protection afforded to soldiers has been questioned, but that there was an amount of protection far from negligible seems certain. Why should this protection be disregarded?

The matter involves social and moral considerations, but the old argument that the sufferer from venereal disease has only himself to blame is threadbare. Too many cases of innocent syphilis have been reported from unquestionable sources. Why should not these innocents, many of them infants, be protected by our health authorities?

We do not undertake to pass judgment on the efficacy of the methods proposed, nor do we pretend to pass judgment on the question as to whether or not the state should go into the free distribution of calomel ointment. It may be pointed out, however, that practically all states give free diagnosis of venereal diseases, and most of them furnish nitrate of sil-

ver for ophthalmia neonatorum, while some supply salvarsan, directly or indirectly, for the cure of syphilis. What is the public motive for curing these diseases? Unquestionably the strongest one is the cutting out of a focus of infection. If this is justifiable, certainly it is more justifiable to prevent the disease in the first instance.

REFERENCE

1. *Boston M. & S. J.*, Aug. 18, 1927.

CONFERENCE ON RABIES

THE FIRST International Medical Conference sponsored by the Public Hygiene Committee of the League of Nations, held during the last week of May, was devoted to rabies. The meetings took place at the Pasteur Institute in Paris and the Commissions were presided over by Professor Bordet of Belgium. Representatives of some thirty nations were present, among whom were a number of noted bacteriologists and directors of Pasteur Institutes. It is safe to say that a more notable gathering of students who have given attention to rabies has never taken place before.

Four principal questions were debated: (1) the morphology and biology of the organism causing the disease; (2) the technic of immunization; (3) the dangers of immunization; (4) the immunization of animals. Each one of these subjects was assigned to a subcommission.

Concerning the first question, after careful consideration of the claim of Levaditi and Manouélian and inspecting their preparations, the Commission concluded that it could not decide as to whether the virus was a bacterium or a protozoan, nor would it express a positive opinion as to whether the Negri body was an evolutional form of some organism or a degeneration of the nerve cells. It confirmed the opinion that the virus was filterable.

Concerning immunization, the opinion was unanimous that the original method of Pasteur, using the dried or the glycerinated cord was entirely reliable, as are also methods such as that of Högyes using dilutions of the living virus. It found also that a satisfactory immunity was produced by virus killed or attenuated by treatment with carbolic acid or ether, though it recommended a more extensive trial of such vaccines. It considered the protective action produced by living virus as more reliable than that brought about by killed virus, and the latter was recommended only when the vaccine was to be shipped to distant places. The question of the plurality of strains was considered and it was recommended that institutes should at regular intervals make studies of the virulence of the fixed virus strain used by them. It was proposed that the Hygienic Section of the League of Nations in conjunction with some Pasteur Institutes should attempt to produce a type of virus constant in its virulence and its immunizing power. The cause of paralysis following immunization was considered unknown, though it was believed that predisposing factors such as alcoholism, syphilis, age, etc., quite certainly played an important part in their production.

Concerning the immunization of animals against rabies, the Commission expressed the opinion that it was desirable to immunize animals in districts where rabies was prevalent, using a single inoculation of killed or attenuated virus and repeating this at intervals of one year. Vaccinated dogs known to have been bitten by a rabid animal should be destroyed, but if only suspected, they might be again vaccinated and kept under observation for six months. The vaccination of cats was not recommended under any circumstances. No changes in

the present sanitary laws were advised. The view was expressed that the complete eradication of rabies depended upon the restriction of the liberty of dogs to the premises of their owners unless they were muzzled, and the destruction of stray animals.

All the questions considered were left open for further study.

The first reading of the report leaves one somewhat astonished at its conservatism, but all who have given any attention to the subject know that there are many questions which remain to be definitely settled. Fortunately we have a most efficient means of rapid diagnosis, and a method of immunization which is as perfect as any human measure can be. Failures when treatment is given promptly under favorable conditions are few, while the degree of protection is high.

We need to disseminate the facts concerning rabies to the public and to overcome by education the many superstitious notions which prevail concerning this interesting yet terrible disease.

PELLAGRA

SOON after the spring flood in the Mississippi River and its tributaries there were reports of an increase in the number of cases of pellagra in the flooded area. Since that time, Drs. Goldberger and Sydenstricker of our Public Health Service, have made an extensive investigation of the situation and have arrived at the disquieting conclusion that the number of cases of this disease in the lower Mississippi Valley has doubled since 1924. The findings will doubtless astonish even those who have tried to keep in touch with the situation, since the estimates are that in the four states—Tennessee, Arkansas, Mississippi and Louisiana—from forty-five to fifty thousand cases will have occurred during 1927, with an estimated death rate of from twenty-three to twenty-five hundred. In one of the localities inspected, the visiting physician estimated that one-fourth of the entire plantation population suffered from pellagra. The information upon which these estimates are based is admittedly general, but has been checked to some extent by a house-to-house canvass, and the officers making the report are convinced of the essential accuracy of their findings. Verily such a situation may be spoken of as an epidemic which demands extraordinary measures on the part of health officers and the public.

As is well known, the studies of Dr. Goldberger and his coworkers demonstrated that pellagra is caused by a diet deficient in an accessory food factor which they have called vitamin P-P, and is prevented by a varied diet rich in this factor, which is found in fresh lean meat, milk and vegetables. No drug is known which has any particular effect in preventing or curing the disease, and stress should be laid on the fact that money spent on drugs would be much better invested in proper foods.

Flood conditions are not entirely responsible, though they have probably had something to do with the situation, the estimate being that about one-half of the cases estimated for 1927 will be in the areas which were overflowed. It seems clear, however, that the present conditions regarding pellagra have an economic origin, the low price of cotton being the chief factor. Since 1925 showed a great increase in deaths from pellagra over 1924, it is evident that flood conditions have been only one factor in bringing about the present state of affairs. The dietary habits of the people in the affected section and the availability of food supplies play an important part in the prevalence of pellagra.

The meat eaten in that area is largely fat salt pork. The meal is corn, and the molasses used is made from sorghum or cane. These three articles form the basis of the ordinary diet. Wheat flour, rice and dried beans are used to some extent, and some home products are consumed, including milk, poultry, eggs, and vegetables such as cabbage, beans, peas, okra and tomatoes, but all things considered, the diet is very deficient and when adverse economic conditions exist, bringing about a low price for cotton, the general working population suffers, since this is the only market crop grown.

The situation is an alarming one. Pellagra came upon the people of the United States unexpectedly, as it were, and the people of the country in general have never realized its extent or its menace.

Prevention obviously requires a complete change in the food habits of the people, and these in turn are largely dependent on economic conditions, such as the tenant system and lack of ready money combined with difficulties of transportation and distribution. Diversification of crops, with increase of milk supply are especially desirable. The Department of Agriculture and the state agricultural colleges are working to better conditions, and with general recognition of the deplorable conditions we may confidently look for improvement.

THE FOX RIVER CONSERVANCY DISTRICT

THERE has recently been formed in Illinois the Fox River Conservancy District, organized by authority of an act of the legislature of 1925 and known as the Conservancy District Act.

The purpose of this act is to permit the centralized control of the disposal of sewage and industrial wastes along an entire river. Engineers have long advocated a centralized control of this character so that the diluting power of a stream may be properly apportioned and utilized by the various cities and industries located on the stream, thus making for the maximum of economy and efficiency in controlling stream pollution.

The trustees of the district are authorized to issue bonds for the construction of sewage treatment works, intercepting sewers, pumping stations and all necessary appurtenances. They can also, under the Act, build such works by special assessment, assessing the cost on the people who actually use the sewers tributary to the treatment works.

In addition, the board is authorized to develop water supplies for the joint use of the various communities in the valley. In this connection it is stipulated that the water must be sold wholesale to incorporated areas through meters, and the rates charged must be such as to cover operating and fixed charges. In other words, the district may lend its credit, through bond issues, to the construction of such works, but the actual cost must be defrayed by the people using the water.

The district has been fully organized for only a few months. Engineers for the district are now making a thorough investigation and report on present conditions with reference to stream pollution. It is expected that this report will serve as a basis for the formulation of policies and the undertaking of special projects.

The successful operation of conservancy districts has not yet been assured. Troublesome political and legal difficulties may yet be encountered. However, the progress of the Fox River Conservancy District will be watched with a great deal of interest as an experiment. If successful it will constitute an important precedent for the establishment of similar districts elsewhere.

INSOLATION PERIOD OF SCARLET FEVER

ONE of the questions most frequently asked at present concerns the isolation period of scarlet fever. The uncertainty felt by health officers is reflected in the laws which we find in various states and communities. Contacts are held in quarantine for as short a time as five days, and patients are kept in isolation for varying periods up to six weeks, while in other places they are held until all discharges and desquamation have ceased. In general there seems to be a tendency toward shortening the period of detention and this has become more marked since the production of scarlet fever antitoxin.

There is very general agreement that the early administration of antitoxin lessens the complications and hastens complete cure. Recent studies[1] on an extensive series of scarlet fever patients have shown that the persistence of hemolytic streptococci in the throat is less for mild than for severe cases—terminal cultures in mild, uncomplicated, serum-treated cases being positive in 27 per cent, against 83 per cent in severe controls with complications; while serum-treated cases in general were positive in 38 per cent, as against 64 per cent for those not receiving serum. There certainly is good ground for shortening the period of detention, which is exceedingly irksome and causes no small loss of valuable time. The longer the period of detention the greater the temptation toward concealment and evasion, so for administrative reasons alone we must welcome the cutting down of the time.

Closely related to this in some aspects, is the decreasing severity of the disease, which has attracted much attention and has been studied by a number of careful observers. In the British Isles, Holland, and the northern part of Italy, the Scandinavian countries, the United States, France and Germany, scarlet fever has been gradually growing milder, with here and there an occasional epidemic of greater severity such as the one noted in Providence, 1906–1907, when the case fatality rose to 17 per cent as against the prevalent rate of 2 to 6; and later, 1923–1924, an outbreak in the same city showed case fatality of only 0.86.[2]

Studies by the earliest observers showed that scarlet fever was notable for the variation in its severity. J. Lewis Smith, in 1881, said, "No disease shows a greater difference in character and severity than scarlet fever." Most of our readers can remember when scarlet fever was regarded with horror, not only on account of its death rate, but perhaps more on account of the sequelae. For some years, however, scarlet fever has steadily decreased in its severity and the sudden increases in the virulent character of certain outbreaks noted in the past have not been in evidence. The change has been gradual and fairly slow.

Chapin is inclined to correlate this change in virulence to hospitalization, or isolation of the severer types. He has collected many figures chiefly from Great Britain to sustain this idea. In the United States the decrease in the fatality of scarlet fever has not been so noted as in England, which he attributes to the slower adoption of hospitalization in this country. He quotes data also from Norway and Sweden, which has led Holst,[3] the government epidemiologist of Norway, to reply.

As late as 1880–1890 scarlet fever was so serious in Norway that in some years it was one of the chief causes of death. During later years not only are there fewer cases, but the infection is now so mild that many times physicians are not called in, and Holst is convinced that the disease is more common than the statistics indicate. He does not believe that isolation of the severe cases accounts for the change in virulence, since the northern part of Norway gives the smallest number of cases, though living conditions and absence of hospitals have made it particu-

larly difficult to handle the disease in that section, while in Oslo, where the best facilities are available, the disease has been most prevalent. He points out that completeness of notification cannot account for this fact, since in Bergen where conditions are just as good, there is much less scarlet fever, and further, no reason yet advanced explains why the case fatality is higher in Sweden than in Norway.

Most interesting is the comparison of Bergen and Trondhjem with Oslo. In the two cities first mentioned, the disease has been treated practically without isolation for some years, while in Oslo strict hospitalization has been practiced. The disease has not been excessive in the two cities in which it is not isolated, and furthermore the case fatality in Bergen has been consistently lower than in Oslo.

These studies certainly furnish food for thought. Holst does not hesitate to say that the incidence of scarlet fever depends upon conditions which are unknown and that it has not been perceptibly influenced by any of the measures tried. He holds further that in view of the facts presented there is no substantial reason for the routine isolation of scarlet fever as far as prevention or lowering the case fatality goes. However, he stresses the importance of health authorities keeping in touch with the disease, since he believes that it may at any time revert to the older malignant type. For this reason reporting of cases should be kept up.

REFERENCES

1. Gordon, J. E. *J. Prev. Med.*, 1, 4:289 (Mar.), 1927.
2. Chapin, Charles V. *J. Prev. Med.*, 1, 1:1 (Sept.), 1926.
3. Holst, J. E. *J. Prev. Med.*, 1, 4:279 (Mar.), 1927.

SCHOOL HEALTH

PUBLIC HEALTH had its origin in epidemics—to stop them after they had started. The emphasis has shifted since—to prevent epidemics before they start. No one can predict just what the future development of the public health movement will be. Two significant straws, however, indicate in which way the gods are directing the wind. There is an increasing application of the things already known. There is also a widespread concentration of effort to safeguard child health.

When six thousand six hundred educators from thirty-two countries met in Toronto recently, more than eight hundred of them registered in the School Health Section, making it the largest of the twenty-six sections. There were also more sessions devoted to this subject than to any other.

Leaders representing countries which have not yet instituted sound school health programs expressed their convictions regarding the value of the classroom teacher as a vital factor; and upon their return home they hope to begin training teachers in health.

This conference displayed a general appreciation of the important part health education in schools may have as a new ally of the older and better established health services in the state. Effective health programs in the public schools will hasten the future development of the entire public health movement.

There was a better understanding as to the responsibility of the school administrator to see that the school program is so organized as to permit health activities to function. This responsibility must be accepted if educators continue to place health as one of the primary objectives of education.

Further development will depend largely upon supervision by those adequately trained, whether educators or medical workers, and upon establishing school health administration upon a scientific basis.

ASSOCIATION NEWS

NOTES ON THE ANNUAL MEETING

Headquarters and Information

Final information about the details of the Fifty-sixth Annual Meeting of the Association at Cincinnati, October 17–21, may be obtained at the Information Desk on the Ball Room floor of the Convention Headquarters, the Hotel Gibson. Programs, badges and ballots will be distributed upon registration, which will open promptly at 9:30 o'clock Monday morning, with the first sessions scheduled for Monday afternoon. Registration will continue from 8:30 A.M. to 6 P.M. each day of the meeting.

General Sessions and Concert

At the first General Session on Monday at 8:30 P.M. there will be the Presidential Address by Charles V. Chapin, M.D., whose topic is "Science and Public Health." The principal speaker at the Tuesday evening Banquet of the Ohio Society of Sanitarians to the members of the A.P.H.A. will be Hon. Nicholas Longworth, speaker of the House of Representatives. There will be a reception and dancing in the Ball Room after each of the General Sessions on Monday and Wednesday evenings.

On Thursday evening will be a unique musical feature—a specially arranged concert by the famous Cincinnati Symphony Orchestra at Emery Auditorium for the A.P.H.A. On this occasion the new guest conductor of the orchestra, Victor de Sabata, conductor of the Monte Carlo Opera and a composer of note, will make his first appearance in America.

American Conference of School Medical Inspectors

To still further stimulate among physicians an interest in health work in schools, and to improve the service, medical inspectors will this year meet again with the American Public Health Association in Cincinnati.

Their meetings will be at the Sinton Hotel on October 17, 1927.

In the morning at 9:30 several brief papers on topics of special interest to school physicians will be presented. Plenty of time will be allowed for free discussion and individual experiences from the floor.

At 6:00 P.M. an informal dinner will be held to be followed by further short speeches by prominent American school medical inspectors.

All school physicians attending the A.P.H.A. are cordially invited to attend and to participate in the meetings for medical inspectors.

Further notice of these meetings will be published in the *Daily Bulletin* of the A.P.H.A.

Physicians who expect to attend or who wish further information should write to Dr. William A. Howe, State Education Building, Albany, N. Y.

Study the Exhibit of Method

On the Roof Garden floor near the meeting place of the Health Officers Section, the Committee on Administrative Practice has made possible an exhibit of some of the outstanding methods of city health administration now in actual practice. Cities over 40,000 population have been invited to demonstrate in as graphic a manner as possible the mechanics and processes in detail by which results are obtained in a specific function.

Largely through the courtesy of the John Hancock Mutual Life Insurance Company the Committee on Administrative Practice is enabled to provide the local facilities necessary for this exhibit without expense to the individual cities.

Even though the time for preparation has been short, more than a dozen cities have indicated their intention to exhibit, and thereby speed up the dissemination of new methods by bringing them to the Annual Meeting where all can see and stud the procedures. Each exhibitor will have a representative present to answer questions and to give supplementary information concerning the work. This exhibit has been arranged primarily to give health officers and bureau chiefs an opportunity to become acquainted with many new or particu-

larly effective methods which, to see by personal visits to the particular city, would be both expensive and time consuming.

It is believed that this display should become a regular feature of the Annual Meeting at which the year's development in the field of administrative methods will receive attention and discussion. From such exhibits might well be built up a permanent display at the office of the Association which would be of service to all students of American public health practice, whether they be local health officers seeking ideas for the improvement of their own departments or visitors from abroad.

ANNUAL EXHIBIT OF HEALTH BOOKS

The Sixth Annual Exhibit of Public Health Books under the auspices of the Association's Book Service will be on the Ball Room floor. Approximately 500 of the newest health books from all publishers will be on display. Few titles more than two years old have been included. The exhibit is in charge of an experienced book clerk who will answer all your questions and offer suggestions for books on any health subject. The Book Exhibit is one of the most popular features of the Annual Meeting. If you have not taken advantage at previous meetings of the opportunity to look over the newest books and to make your selections for your personal and professional libraries, do not fail to do so this year. Copies of the Sixth Edition of the *Catalogue of Health Books*, just published, will be distributed at the Book Exhibit.

DEMONSTRATIONS OF TEACHING MATERIAL

The demonstrations of methods of popular health education conducted by the National Dairy Council, under the auspices of the Public Health Education, Child Hygiene and Food and Drugs Sections will be held on Monday, Tuesday, Wednesday and Thursday afternoons, 1:45 to 3:00 o'clock. These will consist of plays and pageants by children from various states given on the stage of the Roof Garden. There will be a discussion after each demonstration.

EXHIBITS

The commercial and educational exhibits at the Annual Meetings of the Association offer to the members who attend a unique opportunity to inspect equipment of reputable concerns, to learn of the latest developments with regard to laboratory apparatus, approved foods or pharmaceuticals. The exhibit space is carefully allotted and contracts are accepted only from exhibitors whose practices and products meet the high standards of the A.P.H.A.

This year the exhibits are to be arranged on the main Ball Room floor and on the Roof Garden floor. On these two floors all of the sessions of the Association will be held so that the exhibits will be convenient for everyone. Be sure to see them all.

Following is an outline of some of the large exhibits, each statement having been prepared by the exhibitor:

ROOF GARDEN

POSTUM COMPANY, INC., NEW YORK, N. Y., BOOTH NO. 1

The Postum Company will have a complete exhibit of Educational Department materials on food and nutrition available for free distribution to public health officials, doctors, nurses, teachers, and health workers in general. There will also be an exhibit of the products of the Postum Company, Inc., which now include the following nationally known foods:

Swans Down Cake Flour
Jello-O
Minute Tapioca
Baker Chocolate
Blue Ribbon Mayonnaise
Grape-nuts
Post Toasties
Post's Bran Flakes
Instant Postum
Postum Cereal

CLEANLINESS INSTITUTE, NEW YORK, N. Y., BOOTH NO. 11

Cleanliness Institute, established less than a year ago to raise the standards of cleanliness in personal and community life, will exhibit some of its educational material. This includes a series of illustrations in color from a supplementary reader on cleanliness customs in foreign lands, entitled "After the Rain," for children of the third, fourth, and fifth grades; sketches of a series of advertisements calling attention to the importance of cleanliness in all its phases; and newspaper and magazine clippings in which Cleanliness Institute is circulating information ranging from "Why Must I Wash My Hands Before Eating?" to "This is the Way We Wash Our Clothes."

Dr. W. W. Peter, health consultant of Cleanliness Institute, and Sally Lucas Jean, school consultant, will attend the conference in Cincinnati, as will also Julia B. Tappan, director of the school department, and Clifford Goldsmith, "Professor Happy," lecturer for the school department.

FINNELL SYSTEM, INC., ELKHART, IND., BOOTH No. 14

Finnell System, Inc., will exhibit three of its eight models of electric floor scrubbing, waxing and polishing machines, two of its six models of mop trucks, a mopping machine and a water absorbing machine. Special noiseless models of scrubber-polishers designed for hospital installations will feature the exhibit.

EVAPORATED MILK ASSOCIATION, CHICAGO, ILL., BOOTH No. 15

Evaporated milk is made by concentrating clean, fresh, high-grade milk until it is more than twice as rich as the original. In planning diets for persons with wasting diseases or for those who require a concentrated food without bulk, it is invaluable.

In the process of preparation, the fat globules of the raw milk are broken into millions of tiny ones, which cannot rise to form cream. Since the cream is so evenly distributed in the milk, foods made with it have a richness and a smoothness that will tempt the most finicky appetite.

It is sterilized at a temperature of 240° F. and consequently is free from harmful bacteria.

When acted upon by the digestive juices in the stomach, evaporated milk forms soft, delicate flakes rather than clots, a condition which makes it more easily digested. This explains why certain children and convalescents handle evaporated milk so easily, while ordinary milk causes digestive disturbances. In foods such as frozen desserts, sauces, cream soups and beverages made with evaporated milk are some of the excellent ways of introducing milk into the diet. Beverages will be featured in our booth in Cincinnati.

NATIONAL DAIRY COUNCIL, CHICAGO, ILL., BOOTH No. 16

Those interested in attractive ways to illustrate nutrition facts so that they may be brought home to the general public will find of value the National Dairy Council exhibit. A "Health Food Show" will be featured demonstrating the organization of an exhibit of health foods based on the successful Dairy Show in Indianapolis, when Dr. E. V. McCollum supervised the display of foods and their health slogans.

This display of foods is of unusual interest because it is planned not only to carry the nutrition facts but also to present an aesthetic color appeal to the eye, thus carrying out in a new project the ideas of harmony and beauty which are striven for in all the National Dairy Councils health education projects.

In addition to the groupings of primal foods according to their health service to our bodies, there will be panels showing how the demonstrations of the preparation of these foods can be conducted. Other pictures will show the dramatic presentation of stunts which teach their health lesson in a human interest way, such as "The Milk Maid's Chorus," "Punch as a Cook," and "The American Girl Beauty Products."

The Health Food Show, a descriptive booklet of this nutrition project will be off the press for special distribution at the meeting. Orders may be left for other pieces of the health education literature distributed by the National Dairy Council.

KELLOGG COMPANY, BATTLE CREEK, MICH., BOOTH No. 17

Kellogg's All-Bran is a food which acts as a body regulator. This product is made from wheat bran, thoroughly cleaned, cooked with flavoring, and toasted. In addition to being served as a cereal, All-Bran may be used in baking.

At booth No. 17, the Kellogg Company will serve All-Bran muffins with tea. You are cordially invited to call, taste the muffins, and receive the pamphlets distributed by this company through its Home Economics Department.

BALL BROTHERS COMPANY, MUNCIE, IND., BOOTH No. 19

Fruit Jars containing home canned products, both fruits and vegetables, will be exhibited, as well as empty fruit jars of different styles and sizes, and jelly glasses, filled and empty.

AMERICAN INSTITUTE OF BAKING, CHICAGO, ILL., BOOTH NO. 20

The exhibit of American Institute of Baking will be sponsored by its Department of Nutritional Education. In it will be shown the health teaching material that is available for the use of teachers and health workers throughout the country. The display will include posters, pamphlets, charts, and other exhibits.

The exhibit is one of educational rather than commercial value. The points brought out will be of interest to those attending the convention because of the bearing the material has on the general subject of health through proper nutrition. All such information is very pertinent at this time, because of the discussions throughout the country regarding the pseudo-scientific information on diets that is being disseminated through numerous channels.

J. B. FORD COMPANY, WYANDOTTE, MICH., BOOTH NO. 21

"Wyandotte" products, representing as they do the result of over thirty years' experience in the manufacture of specialized cleaners, are worthy of careful investigation.

"Wyandotte" Yellow Hoop possesses, to an unusual degree, the properties required for a successful laundry washing agent.

"Wyandotte" Sanitary Cleaner and Cleanser is peculiarly adapted for all culinary cleaning or wherever foods are prepared, handled, served or refrigerated as well as the other uses for which it is recommended.

"Wyandotte" Detergent produces sanitation at minimum cost, cleaning marble, terrazzo, mosaics, enamel finishes as well as painted surfaces, without the least injury or ill effects.

CREAMERY PACKAGE MFG. CO., CHICAGO, ILL., BOOTH NO. 23

The principal item will be a one-eighth scale demonstrating model of a new type holder for commercial milk pasteurizing plants. This holder has been developed to meet criticisms of existing apparatus, and is constructed upon a principle not heretofore employed for the purpose. It combines the convenience of the continuous flow type with the positive holding assurance of the pocket type and is minus milk valves. The model exhibited is partially of glass so that the interior can be seen and the operating characteristics demonstrated.

Other items include leak detector valves and other accessories for milk pasteurizing plants.

EARNSHAW KNITTING COMPANY, NEWTON, MASS., BOOTH NO. 28

Vanta Baby Garments dress babies for the first two years without pins or buttons, are safe, comfortable, quality garments, recommended by physicians and nurses. They are designed to meet the ideas of doctors. They fit perfectly because they are tied with Vanta Twistless Tape. They are instantly adjustable because they are tied, and not buttoned or pinned. They are so designed that they will not bunch or bind.

They eliminate all danger from pins and buttons. Pins will cut and bruise the baby's body; buttons break in laundering and turn on edge. Both pins and buttons are particularly dangerous because of the tendency of babies to put everything into their mouths.

SOFT WHEAT MILLERS ASSOCIATION, NASHVILLE, TENN., BOOTH NO. 32

Self-rising flour is soft wheat flour to which has been added soda and mono-calcium phosphate as the leavening agent and table salt for seasoning. It may be obtained in any grade of flour desired. The leavening used, however, is of the same quality in all grades. The Blue Shield, wherever it appears stamped on a sack of self-rising flour, is a guarantee of the purity of the leavening ingredients used. It means that such flour complies with the standards established in the laboratories of the Soft Wheat Millers' Association.

Self-rising flour made under the Blue Shield of the Soft Wheat Millers' Association contains approximately nine times as much lime and two and one-half times as much phosphorus as whole wheat flour. Its use will help materially in overcoming one of the outstanding deficiencies in many diets.

QUAKER OATS CO., CHICAGO, ILL., BOOTH NO. 33

The School Health Service of The Quaker Oats Company will exhibit its educational literature.

Hob o' the Mill, by Grace T. Hallock and Julia Wade Abbot, is a compilation of stories for children 9 to 12 years old, telling in an entertaining fashion the part played by grains

throughout the history of civilization. A manual accompanies it which contains suggestions to teachers on ways of correlating *Hob o' the Mill* with school subjects and activities, and presents special health projects which may be worked out from the stories.

Grain Through the Ages, by Grace T. Hallock and Dr. Thomas D. Wood, is of the same high educational standard, is beautifully illustrated and gives the history of grains in language suited to the junior high school age.

There may be also an exhibit of two motion pictures for school use, on the growing of grains and their manufacture into cereals.

BALL ROOM

LA MOTTE CHEMICAL PRODUCTS CO., BALTIMORE, MD., BOOTH NO. 51

Experience during the past few years has shown that accurate control of acidity and alkalinity is one of the most important factors in water purification, sewage and industrial waste disposal, and in bacteriological, and practically every other type of public health work. Workers in these fields will therefore be interested in the La Motte Hydrogen Ion Testing Sets and the Roulette and Block Comparators which will be exhibited.

In addition they are showing the Enslow Chlorine Comparator. This set employs an entirely new principle in that it eliminates the errors due to color or turbidity or to the presence of manganese or iron in the sample. Amateur gardeners may also be interested in two new soil testing sets which are also on exhibit.

DENVER CHEMICAL MFG. CO., NEW YORK, N. Y., BOOTH NO. 52

Antiphlogistine will be exhibited. This is a most extensively employed ethical medical preparation in the world. It appeals particularly to physicians because it gives very effective aid in the treatment of inflammatory and congestive conditions, without in any way interfering with internal medication.

CENTRAL CITY CHEMICAL CO., CHICAGO, ILL., BOOTH NO. 53

Central City Chemical Co. will exhibit at their booth a greatly enlarged model of their Forma-Germkill Formaldehyde Fumigator. As at previous conventions this giant size fumigator is expected to attract considerable attention. July 1 of this year marked the close of the sixteenth year that this fumigator has been on the market, during which time, approximately ten million various sized fumigators have been distributed to health boards, school boards, hospitals, institutions, etc., in this country and in several foreign countries.

CONTINENTAL SCALE WORKS, CHICAGO, ILL., BOOTH NO. 54

The Continental Scale Works of Chicago, specialists in "Personal Weighing Equipment" have their most popular models on display, showing scales designed for school work, rural nurses, clinics and infant practice.

You are invited to inspect these scales at your leisure and offer your scale problems to the attendant in charge.

OHIO FOOD & DAIRY LABORATORY, CINCINNATI, O., BOOTH NO. 55

Christensen's Milk Grading Apparatus—"The Milk Grader," for determining the bacterial content of milk, cream and ice cream by the Methylene Blue Reduction Test, eventually combined with the Fermentation Test. The apparatus is American made in six sizes for 28, 60 and 200 25 c.c. samples, or for 48, 90 and 300 10 c.c. samples, as recommended by the American Public Health Association. For gas, alcohol or with electric temperature control, that has proved of special value during three years and is mostly used. The apparatus—equipped with special tubes, etc.—also serves for detecting blood and pus in milk by the Catalase Test, which is valuable for examining milk from individual cows, particularly when marketed raw as Certified Milk.

Christensen's Propagating Apparatus, "The Culture Propagator," a practical and reliable Sterilizing Incubator with electric control for propagation of cultures and preparation of starters in seamless, enameled cans at any temperature required. For 3 and 6 pints, consisting of "The Milk Grader" with a few accessories. Large apparatus for twice 3 pints and 8 gallons equipped for direct steam, water and brine connections.

Christensen's Cultures, Chlorosol Disinfectant, Moscol Fly Spray, etc.

GILLILAND LABORATORIES, INC., MARIETTA, PA., BOOTH No. 56

A complete line of biological products will be displayed at this booth. This firm gives special attention to supplying biological products to state, city and county boards of health. The representatives in charge will be pleased to answer any inquiries; they extend a cordial invitation to all members to visit their booth.

UNITED STATES STANDARD PRODUCTS CO., WOODWORTH, WISC., BOOTH No. 57

A complete line of biological products including our new "Non-sensitizing" Toxin-Antitoxin prepared by the use of concentrated and refined immune goat serum.

We give special attention to supplying biological products to health departments, and our representative in charge will be pleased to answer any inquiries.

GENERAL LABORATORIES, MADISON, WISC., BOOTH No. 58

B-K, a concentrated sodium hypochlorite, is utilized as a disinfectant, deodorant and sterilizer for sanitary uses in homes, hospitals, hotels, restaurants, schools, milk plants, dairies, etc.

The basic principle of the disinfectant properties is the chlorine content which is promptly available as a disinfectant upon its contact with organic matter. It is manufactured by the General Laboratories at Madison, Wisconsin, for the past fifteen years and the applications advocated by this company are based upon laboratory and field observations by competent technicians. This work has been conducted with an eye to practicability and observations and conclusions have been analyzed from the practical viewpoint.

Representatives and field men including J. W. Yates, Consultant in Sanitation, and W. A. Hadfield, Chief of the Chemical and Bacteriological Departments, will be in our booth at all times during the show to be of such service as they can to those interested.

NATIONAL CHILD WELFARE ASSOCIATION, NEW YORK, N. Y., BOOTH No. 59

Posters suitable for health education in clinics and schools will be exhibited. These deal with problems of nutrition, mental hygiene, breathing, posture, care of eyes, teeth, feet, safety habits, prenatal care, care of babies, and care of the preschool child. They present in attractive picture form a wealth of accurate information about health, furnishing health departments and health workers with visual material for a comprehensive program.

Delegates are cordially invited to examine all of the different series. Orders left during the convention will be filled and billed at any time specified.

HORLICK'S MALTED MILK CORPORATION, RACINE, WISC., BOOTH No. 60

A new note of interest will be found in connection with the Horlick's Malted Milk display during the convention. Following its inauguration of an extensive magazine advertising campaign prepared on the subject of child nutrition, the Racine concern will be prepared to discuss with members of the Association the dietetic value of its product in the up-building of children of preschool and school age. Samples of the new Horlick advertising will be shown and samples of the product, both natural and chocolate flavor, will be distributed.

VITAGLASS CORPORATION, NEW YORK, N. Y., BOOTH No. 61

Vita glass is the glass which transmits all the wave lengths in sunlight. In the actinic range (3200 to 2970 A.U.), Vita glass transmits an average of over 50 per cent. Its use is not confined to any one field but can be glazed in any windows where it is desired to bring outdoor sunlight indoors.

CRANE COMPANY, CINCINNATI, O. BOOTH No. 62

High-grade Sanitary Plumbing Fixtures such as Combination Dental and Water Basin, Drinking Fountains, Water Softeners, Institutional Water Closets and Urinals will be exhibited in this booth.

LYONS SANITARY URN CO., INC., NEW YORK, N. Y., BOOTH No. 65a

A sanitarily constructed milk dispenser for use in restaurants and hospitals which dispense each glass of milk with its share of the butterfats in conformity to the local

health department milk ordinance. No agitator, or other mechanical method of mixing or stirring of the milk is required.

HOSPITAL SOCIAL SERVICE MAGAZINE, NEW YORK, N. Y., BOOTH No. 65B

Orders will be taken for the *Hospital Social Service Magazine*, which is a journal devoted to public health and social service work.

CHEMICAL TOILET CORPORATION, SYRACUSE, N. Y., BOOTH No. 69

Chemical Toilet Corporation will exhibit two types of sewage disposal equipment adapted for unsewered homes or other buildings.

San-Equip Septic Tanks have been made available throughout the United States and some foreign countries and furnish a simple, easily installed and practical, trouble-proof sewage disposal wherever water supply is available for plumbing systems. This equipment is distributed through the plumbing supply trade and usually installed or supervised by the local plumber who may furnish the other plumbing fixtures.

It is considered quite important that some local responsibility be established wherever sewage disposal is provided and the service given by a San-Equip organization through the local plumbing dealer has proved very satisfactory both to the owner and to supervising health authorities.

For summer camps, suburban gas stations, rural schools or other buildings not suited for plumbing installations and not provided with adequate water supply, the San-Equip Chemical Toilet Systems provide a sanitary toilet system. This equipment may usually be purchased locally through the local plumbing dealer.

PNEUMO PHTHYSINE CHEMICAL CO., CHICAGO, ILL., BOOTH No. 71

Pneumo-Phthysine is an emplastrum with a kaolin base exhibiting the following formula: Guaiacol, Formalin, Creosote, Quinine, Methyl Salicylate and C. P. Glycerine.

Its use is indicated in pneumonia, influenza and inflammatory conditions as an antipyretic, antiphlogistic and analgesic.

It must not be confounded with a poultice or an application to provide a merely rubefacient effect, as the remedial agents in Pneumo-Phthysine are absorbed by the skin and carried into the circulation as surely as if the administration had been by mouth or by hypodermic injection—producing the same systemic effects, without any derangement of the stomach or irritation of the muscular tissues, which are sometimes great objections to the use of certain drugs by other methods.

TAYLOR INSTRUMENT COMPANIES, ROCHESTER, N. Y., BOOTH No. 75

Taylor Instrument Companies will demonstrate the Tycos Recording Sphygmomanometer. This is one of the first showings of the instrument which graphically records blood pressure.

A graphic record of your blood pressure will be made and presented to you at the exhibit. This instrument produces automatically, a written record of the blood pressure eliminating entirely the personal equation of the operator. No stethoscope is employed.

This has been a goal in the scientific world for many years, and we are pleased at this time to offer to the practitioner and specialist a practical device for correctly recording blood pressure.

The Office-Type Tycos Sphygmomanometer will also be exhibited. This instrument indicates rate, rhythm and amplitude.

Refinements in the Pocket-Type Tycos will be shown.

Additional instruments on exhibit will include the clinical thermometer, household and utility thermometers.

Medical literature (not advertising) will be distributed giving timely medical opinions.

WALLACE & TIERNAN COMPANY, INC., NEWARK, N. J., BOOTHS Nos. 80, 81, AND 82

Outstanding among the recent developments of Wallace & Tiernan Co., Inc., Newark, N. J., manufacturers of Chlorine Control Apparatus, is the Automatic Vacuum Chlorinator which has recently been installed by Bureau of Water Works and Supply of the City of Los Angeles.

The automatic application of liquid chlorine for water sterilization or sewage disinfection is desirable wherever there are rapid changes in the rate of flow or wide variations between the maximum and minimum flows. By eliminating the necessity of over chlorinating the low flows in order properly to

chlorinate the high flows—as is frequently necessary with manually operated apparatus—the efficiency of the treatment is increased and interesting savings in chlorine result.

The Vacuum type of automatic chlorinator makes use of the principle of control so successfully used by Wallace & Tiernan in their Type MSV apparatus, several thousands of which are now in use throughout the world. Two of the new type Automatic Vacuum chlorinators have been in operation for the New Haven Water Works Company, New Haven, Conn., for a period of two years. Efficiency tests of these units show an average accuracy of 99.5 per cent.

The Western Avenue Pumping Station of the City of Chicago—the largest pumping station in the world—is equipped with these automatic chlorinators.

COMMISSION ON STANDARDIZATION OF BIOLOGICAL STAINS, GENEVA, N. Y., BOOTH No. 83

The Commission on Standardization of Biological Stains will exhibit samples of some thirty-odd stains which have been certified, together with brief explanations of their uses. In addition, microscopic slides will illustrate the uses of stains in the diagnosis of various diseases, including tuberculosis, diabetes, rabies, and abnormal conditions of the blood due to malarial parasites, trypanosomes, and trichinosis. Comparative preparations will demonstrate results obtained with a certified stain in contrast to those obtained with an unsatisfactory, uncertified sample of the same stain, showing the advantages to be gained through the use of certified stains.

DIGESTIVE FERMENTS COMPANY, DETROIT, MICH. BOOTH No. 84

Exhibit of Dehydrated Culture Media and Bacteriological Reagents—Culture media in dry and powdered form, prepared so that when made up for use in the laboratory they will conform to the requirements of Standard Methods of Water Analysis in fomula, ingredients and reaction. Infusion media in dehydrated form prepared for the cultivation of the fastidious and discriminating pathogenic organisms, such as the gonococcus, meningococcus, pneumococcus and other bacteria which are ordinarily cultivated with difficulty.

Approved and standard reagents and ingredients for making up culture media, recommended by the Laboratory Section of the American Public Health Association for water and milk examinations.

Amboceptor and antigens of high titer and sensitivity for complement-fixation and precipitation tests of syphilis.

J. G. CHERRY COMPANY, CEDAR RAPIDS, IA., BOOTH No. 85

This company, one of the largest manufacturers in the country of equipment for the processing of dairy products, will exhibit a complete milk pasteurizing plant meeting every recommendation of the U. S. Public Health Service, as set out tentatively by speakers at the 1926 meeting of the American Public Health Association. Leak Protector Flush Valves and the new Leak Protector Inlet Valves will also be on display so health officers and public health workers may get a clearer understanding of these important accessories.

WM. S. MERRELL COMPANY, CINCINNATI, O., BOOTH No. 86

Modilac was designed to meet the ever increasing need of a food for normal babies. Most infant foods and milk modifiers are the result of an effort to find a corrective diet for sick and abnormal babies.

With the growing tendency of modern mothers to wean their babies as soon as possible, it has become necessary to seek a natural diet for normal babies.

Cow's milk "humanized" with Modilac is the closest approach to human milk that has yet been prepared. It is first of all a natural food—not a synthetic mixture. And it is easy to prepare.

Others exhibiting will be: The Metropolitan Life Insurance Company, New York, N. Y.; The Borden Company, New York, N. Y.; John W. Ladd Company, Cincinnati, O.; *The Survey*, New York, N. Y., and the usual educational exhibits.

AFFILATED SOCIETIES

MASSACHUSETTS ASSOCIATION OF BOARDS OF HEALTH

As a part of the informative discussion which has been undertaken by the Massachusetts Department of Public Health, in the matter of proper regulations governing the pasteurization of milk, the Massachusetts Association of Boards of Health devoted its summer meeting,

that of Thursday, July 21, to a coöperative educational effort. The general subject of the meeting was "Positive Pasteurization." George W. Putnam, Chief of the Bureau of Dairy Products, Chicago Health Department, and Leslie C. Frank, of the U. S. Public Health Service were among the speakers.

MICHIGAN PUBLIC HEALTH ASSOCIATION

The week-end institutes which were inaugurated at the University of Michigan this summer were very favorably received. There were 144 persons registered for these institutes and they cannot fail to be of lasting benefit.

At Jackson the Alpha Gamma Delta Summer Camp for under-privileged children gave an opportunity for almost 250 children to enjoy the benefit of supervised play in the out-of-doors at Crispell Lake, where a proper diet is carefully adjusted to their needs. The work is conducted by university girls who arrive from all over the country at their own expense in order to carry on this splendid work.

Some years ago a site was purchased, a large building erected and since maintained by the citizens of Jackson. The cost of operating is borne by the Alpha Gamma Delta organization. The school staff selects children that will be most benefited by such an experience.

"Due to immunization work started in the public schools of Jackson in 1922, there has been a decided influence on the incidence of diphtheria," said Dr. F. R. Town, the city health officer. "In proof of this there has not been a single case of diphtheria reported since the middle of October, 1926. This is the first fall and winter season that the city has ever been free from the disease. Immunization programs will be conducted this fall with even greater intensity than before."

In the interests of better sanitation for wading and swimming pools, the Health Department of Jackson felt that it could not approve an excavated pond hole for the use of the children in one of the city parks and therefore ordered it emptied. It is believed that such a pool should be concrete lined and the water should be recirculated through some process of treatment.

PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

Dr. Howard C. Frontz, Fellow of the A.P.H.A., of Huntington, Pa., ex-President of the Pennsylvania Medical Association and member of the State Health Department's Advisory Board, has been elected to the Presidency of the Pennsylvania Public Health Association, a vacancy having occurred in that office because of the untimely death of Dr. Carey J. Vaux, of Pittsburgh.

STATE NEWS

CALIFORNIA

Governor Young has appointed Dr. Walter M. Dickie, Fellow of the A.P.H.A., Director of the new State Department of Public Health which began functioning July 29, 1927, the old California State Board of Health passing out of existence July 28, 1927, after having been in operation continuously since April 1, 1870, more than 57 years. Dr. Dickie has been secretary and executive officer of the California State Board of Health since August, 1920. Under the new law he will be a member of the Governor's Cabinet as Director of the State Department of Public Health.

Dr. Frank G. Crandall, a member of the A.P.H.A., has been appointed Health Officer of Santa Barbara County. Dr. Benjamin F. Saylor has succeeded Dr. Earnest Dozier as Health Officer of Shasta County, and Dr. Richard Stewart Hiatt has been appointed City Health Officer of Ceres.

CANADA

The May number of the *Canadian Red Cross Journal* refers to the new Red Cross Preventorium in Ottawa as "a dream of the health workers of Canada" come true. The preventorium, which is a fireproof structure with accommodation for about 30 children and admirably appointed for its purpose, will form part of the Royal Ottawa Sanatorium.

The preventorium was formally opened by His Excellency the Governor-General on February 16 last, in the presence of a distinguished and representative gathering.—League of Red Cross Societies *Information Bulletin*, Aug. 1-15, 1927.

CONNECTICUT

One of the major activities of the State Department of Health is exhibiting health material at fairs. The first exhibit of the season was August 31 at East Haddam, which will be followed by others during the fall.

INDIANA

At a meeting of the State Board of Health, June 14, Indianapolis, Ind., Dr. William F. King, a member of the A.P.H.A., was re-elected secretary of the board. Dr. James A. Turner, Ladoga, Ind., was elected president of the board at this meeting. Dr. Amos Hostetler, Lagrange, Ind., was elected vice-president.

Dr. Sylvester I. Arthur, Princeton, Ind., has been appointed Health Officer to succeed the late Dr. Robert A. Cushman.

IOWA

Dr. Arthur L. Bryan has been reëlected health officer of Muscatine, Ia.

KANSAS

Dr. Clinton C. Fuller, Norton, has been appointed head of the full-time Health Department for Cherokee County, effective, July 1.

KENTUCKY

Dr. John C. Morrison, Hickman, has been appointed Health Officer of Paducah, effective, August 1, to succeed Dr. Francis M. Munson, who resigned several months ago.

MICHIGAN

Dr. R. A. Stephenson, formerly Health Commissioner of Flint, Michigan, and for the past two years on the Pediatric Staff of the Mayo Clinic, will resume practice in Flint on September 1.

MINNESOTA

Dr. Alvah W. Jones has been appointed health officer of Red Wing, to succeed Dr. Myron W. Smith.

MISSOURI

The Third Annual Meeting of the Missouri Conference on Water Purification will be held at Sedalia, Mo., October 13–15. At this meeting will be presented an interesting program dealing with water purification plant problems, the operation of well water supplies, and maintenance of sewage disposal plants.

MONTANA

Dr. Curtis W. Wilder, Lewiston, has been appointed Health Officer to succeed the late Dr. Thomas H. Pleasants.

NEW MEXICO

The New Mexico State Bureau of Public Health announces under date of August 2 an encouraging reduction in the number of infantile paralysis cases reported. The areas first affected, and which had the greatest number of cases, are experiencing the greatest diminution.

Oklahoma and Texas have each a few cases in their western counties. The health officers of those two states, and of Colorado, have given assurance of their full coöperation in preventing spread of infection from these areas to New Mexico. California is also giving full publicity to the increase of infection within its borders. A case or two have been reported in Colorado.

Dr. Howard W. Heymann, Raton, New Mexico, has been appointed part-time health officer of Colfax County, to succeed Dr. Augustus B. Stewart.

PENNSYLVANIA

The Bureau of Women and Children of the Department of Labor and Industry of the State of Pennsylvania has issued a directory of industrial nurses in Pennsylvania. The Directory contains 197 names, listed according to the establishments in which they are employed. It is issued with the statement that it is incomplete, but with the hope that by publishing it other nurses and other establishments not included will offer the department an opportunity to add their names to the list.

RHODE ISLAND

The New England Health Institute was held this year at Providence, R. I., September 27–30 under the direction of the Rhode Island Board of Health.

TEXAS

The *Health Officers Bulletin* of Texas (Austin), Aug. 15, 1927, contains many suggestions and instructions to health officers regarding the sanitation of school houses: Directions are given for collecting samples of water, and shipping to the State Department of Health Laboratory for analysis. A report is made on a recent typhoid epidemic in a Texas town, with recommendations for a general clean-up in other towns to prevent similar hazards. Twenty-six cases of poliomyelitis are

reported, with warnings to tourists to keep children away from sections where this disease is prevalent. A war against rodents in Waxahachie and Kosse is announced.

Towns and cities in Texas that have adopted and are enforcing the standard milk ordinance, which makes provision for strict supervision of the production and distribution of milk supplies, have been placed on the honor roll by the State Department of Health, according to announcement made by Dr. J. C. Anderson, State Health Officer. The towns named on the honor roll are: Abilene, Amarillo, Austin, Beaumont, Breckenridge, Brownwood, Brownsville, Bryan, Corpus Christi, Corsicana, Cisco, Denison, Fort Worth, Jacksonville, Kerrville, Lubbock, Marlin, Marshall, Mineral Wells, Nacogdoches, Paris, San Angelo, Temple, Texarkana, Tyler, Waco, Weatherford, and Wichita Falls.

The average daily consumption of milk per capita in these towns having the standard milk ordinance, has been found by accurately kept records to be ½ pint. San Angelo heads the list in this respect, the average consumption of milk in that city being 1.02 pints per capita. Many dairies in these towns are now weighing the daily output of milk in order to keep accurate statistics on the production and value of each cow. Records also show that the butter fat content of milk produced by dairies in these towns is much in excess of the state law governing this phase of milk production.

Towns having the standard milk ordinance which have the highest percentage of milk supplies pasteurized, are Fort Worth, with 87 per cent of all supplies pasteurized, closely followed by Beaumont, Wichita Falls, and Corpus Christi.

The demand for information in regard to the workings of the standard milk ordinance has become so great, that the State Department of Health has announced that it will conduct a short school of instruction on milk production, stressing both sanitation and economical features, at Houston November 1–4, in connection with the Short School for Sanitarians to be held there at this time.

NEW MEMBERS

Harold H. Biggs, B.S., M.D., Wadsworth, O., Health Commissioner
James D. Blevins, M.D., Beaumont, Tex., County Health Officer
Boris D. Bogen, Cincinnati, O. (Assoc.)
Mary Breckinridge, R.N., Wendover, Ky., Director, Kentucky Committee for Mothers and Babies, Inc.
L. R. Gaddis, M.D., Port Huron, Mich., Health Officer
J. Victor Greenebaum, M.F., Cincinnati, O., Director of Pediatric Service, General Jewish Hospital, and Attending Physician, Pediatric Service, Cincinnati General Hospital
Albert E. Lingert, B.Sc., Portland, Ore., Sanitary Inspector, City of Portland Water Bureau (Assoc.)
F. Amaral Machado, M.D., Fortaleza, Brazil, Director of the Rural Hygiene Department (Assoc.)
D. Mezincescu, M.D., Bucharest, Roumania, Professor of Hygiene, Institute of Hygiene (Faculte de Medicine) (Assoc.)
George D. Norcom, Charlotte, N. C., Superintendent of Filtration, Charlotte Waterworks
Sara B. Place, R.N., Chicago, Ill., Superintendent Infant Welfare Society of Chicago
Lois Preach, R.N., Anderson, S. C., Public Health Nurse
Paulo Sa, C.E., Rio de Janeiro, Brazil, Engineering Consultant (Assoc.)
Joyce T. Sheridan, Philadelphia, Pa., Medical Director, Philadelphia Life Insurance Company (Assoc.)
Murray M. Shoemaker, Cincinnati, O., Member of Public Health Federation (Assoc.)
N. Sifritt, M.D., Marion, O., Health Officer
Alice M. Stevenson, A.B., Northampton, Mass. (Assoc.)
Montgomery A. Stuart, M.C., U.S.N., Washington, D. C., In Charge of Division of Hygiene, Sanitation and Preventive Medicine, U. S. Navy
Ivah W. Uffelman, R.N., Nashville, Tenn., Director Nursing Service, Nashville Council for Public Health Nursing
Bessie R. Wicker, R.N., Temple, Calif., Public Health Supervisor, Los Angeles County Health Department
David R. Williams, M.D., Girard, O., Health Commissioner

DEATHS OF A.P.H.A. MEMBERS

Lieut. Col. Henry J. Nichols, Assistant Surgeon of the Panama Canal Department of the Army, died early in September at the hospital at Ancon, Panama, following an operation for appendicitis. He will be buried at Arlington Cemetery, Washington. He has been a member of the Association since 1920 and a Fellow since 1925.

Colonel Nichols is well known in medical circles because of his research work. His work on syphilis and typhoid fever contributed greatly to their control in the Army during the World War. He has added greatly to the present knowledge of hookworm, filariasis, pellagra, tropical fevers and cholera.

Colonel Nichols was president of the American Society of Tropical Medicine in 1919 and

was editor of the *American Journal of Tropical Medicine* in 1926, when he was transferred to the Panama Canal Zone.

Dr. Henrique Autran, Chief of the Public Health Department of Rio de Janeiro, Brazil, and a member of the American Public Health Association since 1925, died on July 24.

He was an active member of the National Academy of Medicine of Brazil. Resolutions on his death were passed by the Academy, by both houses of the National Congress of Brazil, and the Local Council of Rio de Janeiro.

APPLICATIONS FOR FELLOWSHIP

PUBLIC HEALTH NURSING SECTION: Ada Taylor Graham, R.N., Columbia, S. C.
Marguerite A. Wales, R.N., New York, N. Y.

LETTERS TO THE EDITOR

TO THE EDITOR:

The review of Dr. Crumbine's "Questionnaire Survey of Milk Borne Disease—1926" in your July issue has been called to my attention and cognizance is especially taken of the paragraph dealing with certified milk.

The certified milk involved in the Connecticut epidemic was produced under woefully inadequate state regulations. According to national standards there are sixty form requirements protecting the safety of certified milk. This so-called certified milk in Connecticut was governed by merely seven or eight requirements, and in no sense should have been classed as certified milk. Even the seven or eight meager requirements were practically not enforced. The National Associations governing certified milk had strenuously protested this inadequacy in Connecticut and had repeatedly urged the replacement of their requirements by the Methods and Standards of the National Associations for the production and handling of certified milk which are so generally in effect throughout the United States.

So lax was the supervision in this Connecticut incident that milk from an outside and unapproved source was brought in and bottled and sold as certified milk. For this infraction the producer's certificate was withdrawn.

May we ask if any milk is safe in dishonest hands? Under such conditions and in such hands would this milk necessarily have been safe even if pasteurized?

Our association is in hearty accord with efforts tending toward the proper pasteurization of all milk of a lesser grade than certified, but believes that the medical profession is entitled to a little milk of this grade under its supervision and produced and handled under no less requirements than the National Standards.

For this misfortune of dishonesty we seem to have to bear a blanket indictment of our cause by Dr. Crumbine. Cannot crookedness or dishonesty occur with pasteurized milk as well as with certified?

Our information and belief is that there are all possible gradations in pasteurization efficiency—from the crook or faker who merely runs milk through some filthy old machine, to plants of the highest efficiency and integrity. But sooner or later it will be realized that there is not sufficient public protection in merely saying "pasteurized." How is it done? and by whom it is done? are pertinent questions. Hearken to Montreal!

Certified milk is relatively safe, and pasteurized milk is relatively safe, but like certified it cannot be too rigorously guarded. Thus we feel that we can take exception to Dr. Crumbine's statement that "the only complete safeguard for all milk supplies is pasteurization."

Very truly yours,

HARRIS MOAK, M.D.

Secretary American Association of
Medical Milk Commissions, Inc.,
Brooklyn, N. Y., August 12, 1927.

TO THE EDITOR:

The letter of Harris Moak, M.D., Secretary American Association of Medical Milk Commissions, Inc., under date of August 12 to the American Public Health Association was brought to the attention of Stanley H. Osborn, M.D., Commissioner of Health for Connecticut, but inasmuch as milk control work in this state is in charge of the Dairy and Food Commissioner, Dr. Osborn has suggested that I make reply to the criticism of Dr. Moak concerning the situation of certified milk in Connecticut.

Dr. Moak says that certified milk involved in the Connecticut epidemic was produced under woefully inadequate state regulations. He said: "According to national standards there are sixty form requirements protecting the safety of certified milk. This so-called certified milk in Connecticut was covered by merely seven or eight requirements, and in no sense should have been classed as certified milk." At the time of the epidemic there were

twelve sections of the specifications, and not eight, for producing certified milk in Connecticut. It would not take any great stretch of imagination to spread these twelve out to sixty, if we thought best to do so; for instance, the requirements for tuberculin test and veterinary supervision, according to the Standards of the American Association of Medical Milk Commissions takes up ten sections, while the requirements in Connecticut specifications are more adequately covered by two sections. The aim of the Milk Regulation Board has been to condense and simplify the requirements as much as possible.

Dr. Moak states that even seven or eight meager requirements were practically not enforced. I would respectfully invite Dr. Moak to point out to me the requirements that were not enforced. He states that "so lax was the supervision in this Connecticut incident that milk from an outside and unapproved source was brought in and bottled and sold as certified milk." In this particular case it was cream, and not milk, which, however, makes no difference. The proprietor owned another farm, which the records will show was in fine order, but he had never asked for a certification; therefore the certificate for certified milk was withdrawn. This cream, however, had no connection with the outbreak of septic sore throat.

Neither the Connecticut specifications for certified milk, nor the Methods and Standards of the American Association of Medical Milk Commissions (no matter how rigidly enforced) would have prevented this outbreak of septic sore throat, as this came from the mistress in the boarding house where a portion of the help got their meals, and I fail to find any requirements for the physical examination of such persons, either in Connecticut requirements or those of the medical association.

If all medical commissions had functioned in accordance with the methods and standards for the production of certified milk in the past, the Connecticut Milk Regulation Board would never have been called upon to adopt specifications for the production of certified milk. There were good commissions and poor ones, and at the time of the adoption of Connecticut specifications there was so-called certified milk sold in Connecticut under a medical milk commission, and no agent of that commission had ever visited the farm or taken a sample of milk, and we are reliably informed that they never had a real tuberculin test at the farm until the one that was applied under the supervision of the Commissioner on Domestic Animals of this state.

Dr. Moak states that the association has repeatedly urged the replacement of our Connecticut specifications by adopting the Methods and Standards of the National Association, which is very true, and the writer has made strenuous efforts to interest physicians in forming a medical commission for this state, and thereby relieve this office of the burden and expense of supervising certified milk, but there is apparently no desire on the part of the health officers, especially, for such a movement. One health officer replied: "We have had enough of that experience in the past, and I am perfectly well satisfied with the supervision given by the State Department."

I am firmly of the opinion that the present specifications for certified milk in Connecticut are as efficient and in some respects, superior to the Methods and Standards for the production of certified milk of the American Association of Medical Milk Commissions. I believe that all milk control officials must realize that there is always a possibility of dishonest work and so long as the human element enters into the production and distribution of milk there will always be the possibility of something being left undone that should be done. Honesty in milk supervision and production is not necessarily confined to milk produced under the supervision of Medical Milk Commissions.

Relative to that portion of Dr. Moak's letter referring to pasteurization, I do not feel that it is necessary for me to answer as this was not aimed especially at Connecticut. We believe, however, that we have the best state pasteurization laws, and most efficiently enforced of any state in the Union. There are a few cities in the country that equal our state pasteurization laws and enforcement, but none that excel.

Yours very truly,

THOMAS HOLT

Dairy and Food Commissioner,
Hartford, Conn.
September 12, 1927.

BOOKS AND REPORTS

The Activated Sludge Process—*By Arthur J. Martin, Consulting Engineer (London), Past-President of the Institution of Sanitary Engineers and of the Association of Managers of Sewage Disposal Works. London: Macdonald and Evans, Ltd. (8 John St., Bedford Row, W. C. 1)*, 1927. 415 pp., 76 ill., 54 tables. Price, $7.50.

This book is a notable record of the theory and practice of a new method of sewage treatment which has arisen during the past dozen years or so. Its outstanding achievement is the successful bringing together in a single volume of such experiences from all parts of the world. This formidable task of assembling data from all principal sources has been performed with great pains and accuracy.

The material is logically arranged and readily available for reference through an admirable index. An important feature of this comprehensive summary of the literature on this subject lies in the quotations from original sources scattered in many places and not readily available to most workers in this field of municipal sanitation.

Mr. Martin first devotes about 125 pages to the history of this process and the various experiments upon which it is founded. The beginnings in the laboratory and other small scale operations with aeration of sewage are clearly set forth as are the transition stages both in theory and practice whereby the present-day units on a working scale have been evolved. Both English and American practice is described as regards methods for the distribution of air and other means of providing effective aeration by mechanical agitation.

Then about 130 pages are devoted to an unusually complete discussion of the theory of the process as developed by available literature, with liberal extracts in the original phrasing of the important findings of various workers. Next come the plant requirements of the process with descriptions of interest to designers as well as records of performances of particular importance and interest to plant operators. This portion of the book is especially valuable through the thorough discussion it gives to the need of preparatory treatment of the sewage; the comparative merits of different designs for the bottom of the tanks and the arrangement of their baffles; and particularly experiences with different appliances in securing agitation to oxygenate the liquid by compressed air and by mechanical agitation.

The remaining third of the book deals with comparative cost data based first upon actual operating cost records and with particular reference to combinations of processes and factors tending to lessen the cost of power and other items. These include the use of air as a preliminary treatment of sewage in connection with existing filters as at Birmingham, Burnley and Decatur. The problem of sludge disposal is given attention in a comprehensive review of both British and American experiences. These are brought up to March, 1927. Appendices record the characteristics as to flows, tank capacities, settlement and aeration periods in all the principal British and American plants, as well as the rated horsepower required to compress stated volumes of air at given pressures.

Mr. Martin has shown a high order of ability in summarizing in a single volume such a vast fund of information and arranging it for such ready use. His ripe experience and his painstaking, exhaustive study through a long term of years could alone bring about such a noteworthy book which will long remain an important reference book. It should be consulted by all who deal with thorough-going sewage treatment methods calling for an efficiency approximating that of filtration. GEORGE W. FULLER

Should We Be Vaccinated? *A survey of the controversy in its historical and scientific aspects—By Bernhard J. Stern. New York: Harper*, 1927. 140 pp. Price, $1.50.

Whatever his answer may be to the question in the title of this book, the reader will find this an exceptionally helpful survey of the entire vaccination controversy. The book is scholarly, and furnishes a valuable clue to the significant documents bearing upon vaccination from the scientific and political point of view as well as from the forensic angle. At the same time the author, while he has made up his mind as to the merits of vaccination, preserves an

objective, and even a sympathetic, attitude towards those whose position is opposed to his. It would be of great help to health officers, public health nurses, workers in health education, and others who are frequently confronted with objections to, or fear of, vaccination to learn the sources of these hostilities and resistances; and there is no more convenient or more reliable means to this end than Dr. Stern's compact volume.

The issues involved must be peculiarly far-reaching in a controversy that enlists on one side the most ignorant and superstitious along with such men as George Bernard Shaw, Herbert Spencer and Alfred Russell Wallace, and on the other side the outstanding leaders in science, medicine and sociology along with the unthinking who follow like sheep. We are therefore prepared to find that economic interests, religious dogmas, economic bias, political theory and personality conflicts played a much larger part in the controversy than the comparatively simple issues as to the merits or dangers of vaccination. And it must be said that both sides have used an abundance of irrelevant argumentation to support their respective positions.

Among the outstanding matters that are of interest at the present time is the information that the association between vaccination and syphilis was initiated by Dr. Joseph Merry of Bath, "whose financial interests were threatened through the loss of his practice" of arm-to-arm inoculation of smallpox. In more recent times the opponents of vaccination have exploited this entirely unsupported doctrine by ascribing it to the authority of Dr. Edgar M. Crookshank, at one time bacteriologist at Kings College, London, who has, however, repudiated the suggestion as "monstrous." Crookshank's own opposition to vaccination, before the Royal Commission, was based on a theory of specificity, which could not allow an immunization against one disease to be brought about by the inoculation of material derived from a different disease. His theory regarding the "analogy" between vaccinia and syphilis referred only to a similarity in the clinical picture during certain stages of the two diseases. While contaminated vaccines were undoubtedly quite common in times past, it is all but impossible for a vaccine to be contaminated with the germ of syphilis since calf lymph has come into use (1881), inasmuch as the bovine species cannot be infected with syphilis and the classical lues bovilla is a totally different disease.

Most of the material used by the propaganda against vaccination dates back to the early days following Jenner's introduction of the practice, or to the material presented before the Royal Commission over thirty years ago. It is characteristic of the propaganda to use the antiquated data and arguments without date—and one might add without responsibility. One of the outstanding examples is the frequent reference to the division of medical opinion regarding the value of vaccination, or regarding its dangers, with special reference to a single Doctor Hamernyk of Prague who, alone of five hundred and forty-two physicians interrogated by Dr. Simon in 1856, regarded "both inoculation and vaccination at best but harmless trifling." It was the returns on this questionary that was responsible for the compulsory vaccination act of 1858.

In addition to other "arguments" and "opinions of authorities" that are virtually lies, there are also examples of arbitrary and short-sighted misuse of power by those who favored vaccination as well as examples of sincere and rational opposition to the practice, especially in the political and administrative aspects. There is no doubt, for instance, that the stress upon the virtues of sanitation was in vast numbers of cases motivated by the feeling that the intolerable housing and living conditions in the industrial cities were deserving of more radical consideration than the health authorities and officials were willing to concede; vaccination thus appeared as a cheap substitute for genuine improvement in the health of multitudes. On the other hand, the famous "Leicester experiment" which was an attempt to control smallpox by exclusive reliance upon sanitary measures eventually broke down, and Dr. C. K. Millard, the health officer and perhaps the most intelligent medical authority who ever attempted to do without vaccination, conceded that vaccination and re-vaccination were necessary as a defense against smallpox, in addition to adequate sanitation.

In spite of the blunders and unwarranted claims as to permanent immunity and misunderstandings of the early vaccinists, and in spite of the long list of disasters from secondary infections following vaccination and other untoward circumstances, and in spite of the formidable array of "authorities" and "arguments" presented before the Royal Commission, the latter concluded that several direct experiments had amply established the efficacy of vaccination as a preventive of smallpox, that the

statistical evidence indicated unequivocally a reduction in smallpox as a result of the practice of vaccination, and that vaccination was a necessary supplement to sanitation if smallpox were to be completely eradicated. It is the evidence against vaccination presented before the Royal Commission (1889–1896), with a rehash of some of the earlier material and an elaboration of sporadic examples of smallpox following vaccination and of untoward complications following vaccination, that are to-day the chief stock in trade of the anti-vaccinationists; and it is interesting also to find that since the time of Jenner the strongest support for the propaganda has come from cultists and faddists and "irregular" doctors of all sorts.

Dr. Stern refers to the continuity of the propaganda in England as related to a legacy of twelve thousand pounds sterling in 1909. We have also in this country in addition to those whose economic interests are directly related to combating what is "regular" in medical and public health practice, several vested funds which serve as permanent sources of such propaganda. We cannot, however, disparage the economic motive in such agitation unless we will agree to develop the means for educating the public without any reliance whatever upon those who have an economic stake in the promotion of such methods and devices as seem to us warranted by the best knowledge available.

Chapter 15 gives an excellent summary of the various types of opposition to vaccination; and there is a chronology of important dates in the history of vaccination from 1713 to 1913. The value of this little book would have been greatly enhanced by an index.

B. C. GRUENBERG

Mother India—*By Katherine Mayo. New York: Harcourt, Brace,* 1927. 440 pp. Price, $3.75.

This is a book of unintentional horror, a bold record in fascinating style by an observer with a photographic mind and a gift for extracting information from people and documents. Miss Mayo went to India "unsubsidized, uncommitted and unattached, to observe of common things in daily human life." Apparently she survived, and so, I think, will this book already in its fourth printing in three months.

While not a trained public health worker, the author appreciates the significance of the almost total lack of understanding of public health among the people. Her account gives a most vivid picture of conditions as they exist particularly among women and children.

Discouraged public health workers, and one hears of such occasionally, might well read this book from cover to cover and receive new courage.

No situation imagined could be more dismally hopeless than the one she portrays as confronting the health authorities in India. History, customs, racial handicaps, caste, religion, politics, illiteracy, poverty, early marriage, ignorance and every other possible foe to progress stand entrenched behind walls so thick and so high as to make them seem impregnable. And yet, with names unsung, there are many men and women who are devoting their lives facing and trying to break through those walls.

W. W. PETER

The Human Body—*By Trevor Heaton, M.D., Student and Tutor of Christ Church, Oxford; and Dr. Lee's Reader in Anatomy. New York: Dutton,* 1927. 250 pp. Price, $3.00.

This volume belongs to the Simple Guide Series which are described as "Books beautifully written and filled with information." This is the only one of the series which the reviewer has seen, but, as far as it is concerned, the description is accurate. The author says that his purpose is not to impart instruction so much as to awaken interest in a subject which is usually made difficult by technicalities. In spite of this modest claim, the book is filled with information concerning the body and its functions, presented in non-technical language, and is conspicuous by its scientific accuracy. The author not only has command of his subject, but has the faculty of writing clearly as well as interestingly.

It is seldom that a reviewer can commend a book so unreservedly. It is difficult to select any chapter for especial praise, but in view of the shameless exploitation of the internal secretions and extracts of the glands which produce them which is going on at the present time, we believe that the chapter describing them deserves special mention. The author wisely and repeatedly stresses the fact that the internal secretions are dependent one upon the other, and that the glands themselves are controlled by a "system of check and counter check" which we do not understand and to which there seems to be no end.

The book is well illustrated by drawings and a number of colored plates. It is excellently printed on light paper. We wish for it a wide circulation.

M. P. RAVENEL

Manual of Bacteriology—*By Robert Muir, M.D., and James Ritchie, M.D. (8th ed.) New York: Oxford,* 1927. 821 pp. Price, $4.75.

It is a pleasure to record the publication of the 8th edition of this book just thirty years after its initial appearance. The manual is too well known in this country to require any statement of its contents and it would be equally superfluous to comment upon its value as a reference and textbook. The clear lucid style in which scientific material is presented to the reader makes a perusal of the volume a pleasure. The discussions are well abreast of the advancement of knowledge in the field of pathogenic microbiology. The reader cannot but be impressed with the fair treatment of unsolved or controversial problems, of which those connected with tuberculosis and with influenza are examples. Minor criticisms may be made, such as the omission of the Kahn flocculation test for syphilis, the precipitin test for the typing of pneumococci and the recent work on the differentiation of fecal from non-fecal organisms of the colon-aerogenes group. It is possible that these were intentionally left alone. The manual will continue to rank, as it always has, among the few good textbooks on pathogenic bacteriology. J. F. NORTON

Nerves, Master-System of the Body—*By David Fraser-Harris, M.D., D.Sc. (Birm.), B.Sc. (Lond.)*

The Teeth and Heart—*By J. Sim Wallace, D.Sc., M.D., L.D.S.*

Child Health and Character—*By Elizabeth M. Sloan Chesser, M.D. London: Faber and Gwyer, Ltd., The Scientific Press,* 1926 and 1927. Price 3s. 6d. each.

These volumes belong to The Modern Health Books series, edited by D. Fraser-Harris, M.D., and maintain the high standard set by their predecessors, which have been reviewed in these columns.

The first is by the editor of the series, and gives a well considered and readable account of the functions of those most important structures upon which all activities of the body depend. It may be that the average reader will find certain of the discussions hard to understand, in spite of the clear language in which they are couched, but this is no reason for not attempting to educate the public concerning functions about which almost everyone speaks with glibness born of ignorance. This volume contains some rather dogmatic statements which may possibly be questioned. We are told that the nervous system is made or marred during the first seven years of life, and that children of a nervous type should not be taught to read until they are about eight years of age. There is an interesting chapter on Fatigue, Sleep, Dreams and Hypnotism, and the book is concluded with an excellent discussion on the maintenance of neural health. There are a limited number of good drawings to illustrate the text.

Only recently has the medical profession come to give proper consideration to the hygiene of the mouth, and its bearing on the general health, to which the second volume is devoted. It is possible that we have gone to the other extreme in some respects and attribute too many ailments to disorders of the teeth and gums. A well balanced and sane consideration of evidence is always of value. The volume before us is written in the clear and simple language which characterizes the series to which it belongs, and considers all of the fundamental facts concerning the form and structure of the teeth, the physiology of mastication, the prevention of decay and general infection, and the proper foods for the best development of the teeth. The book is illustrated by some excellent line drawings.

Child Health and Character begins with infancy and leads us through the various stages of life up to and including adolescence. A chapter on child psychology points out many of the mistakes made by mothers, and teaches them how to avoid the development of characteristics which make the child difficult. A chapter is devoted to the "Difficult Child," which considers certain morbid tendencies and proper training for their correction. A large part of the book is given to general hygiene as applicable to children. Diet, sunlight, games, etc., are well considered in relation to their effect on the development of the growing child. The prevention of illness is considered from a standpoint too often neglected. The author combats the idea that children "grow out" of certain ailments, and points to the danger of rheumatism with its dire after-effects on the heart. One may question the agency of some of the causes of rheumatism given, and it grates on one's nerves to find the word "rheumaticky" constantly used, but in spite of these minor criticisms, the book is a worthy companion of the other members of this excellent series, which can be most heartily recommended.

M. P. RAVENEL

Dudley Allen Sargent: An Autobiography—*Edited by Ledyard W. Sargent, with an Introduction by R. Tait McKenzie, M.D. Philadelphia: Lea and Febiger*, 1927. 221 pp. Price, $2.00.

To most of those engaged in the profession of physical education who have reached middle age, Dr. Sargent was friend and counsellor, as well as a standard bearer in the forward march of the profession.

His portrayal of early life in Hingham, Mass., and in Belfast, Me., is peculiarly fascinating to one interested in the sports and pastimes of boys living in small seashore towns fifty or more years ago.

Dr. Sargent traces his personal development, and the factors which led him to choose what was then a new profession, with most interesting exactness. His experience was broad and developing. A boy in a seaside town, a sailor before the mast, a professional gymnast in a travelling circus, a student at Bowdoin, acting as instructor in physical education in order to earn funds to get himself through college, a medical student at Yale, acting in similar capacity there and for like reason, and his final decision to make physical education his life work, are all very interestingly portrayed.

His experience at Chautauqua and his great struggle to overcome the natural diffidence which overshadows the life and work of so many New England boys, is an interesting phase of his development.

Then came appointment at Harvard as Director of Gymnasium and Assistant Professor of Physical Training, beginning September 1, 1879.

The feeling which still unfortunately exists in many academic minds that any dealing with the building or strengthening of body processes is beneath the dignity of an educated man was then the predominant sentiment of college faculties. Dr. Sargent's account of his early efforts to adapt this program to the needs of the student to the mental attitudes of faculties, and to inadequate facilities, is an interesting story of persistence, enthusiasm, and high ideals, overcoming almost unsurmountable obstacles.

Dr. Sargent in his career developed and made usable much of the apparatus now in use in school and college gymnasiums. He is noted particularly as having made usable various types of pulley weights and developmental exercises. He was the first director of the new Hemenway Gymnasium at Harvard University, at that time a model of gymnasium construction. He established the Sargent Normal School of Physical Education, and started and put into a leading place in the educational field of America the Harvard Summer School of Physical Education.

To those thousands of friends of Dr. Sargent, and to all those interested in the history and development of physical education in America, this is a peculiarly appealing book.

CHARLES H. KEENE

Saving Eyesight After Mid-Life—*By Dr. J. Herbert Waite, Instructor in Ophthalmology in the Harvard Medical School. Cambridge: Harvard Univ. Press*, 1927. 48 pp. Price, $1.00.

This is one of the "Harvard Health Talks." It attempts to provide authoritative information on the little understood subject of causes for blindness after mid-life. This booklet emphasizes glaucoma as the principal cause of blindness arising after the fortieth year, the author estimating that one-third of all blindness is caused by this disease. More than half the book discusses this one cause and in terms which can be understood by readers who have an elementary knowledge of the science of optics. Excellently drawn illustrations show what symptoms are discoverable to a trained ophthalmologist in a regular examination, and are significant to the general reader as evidence of the certainty of diagnosis by a competent practitioner.

Dr. Waite also points out that the public generally thinks of glaucoma only in its active form, while most of the loss of sight caused by this disease does not come from the acute type but from the chronic type which gives no warning of its presence sufficient to attract the attention. The book gives no certain ways in which a layman may recognize in his own case the early approach of glaucoma, except it be of the acute kind where perforce pain sends the sufferer post haste to the doctor. The lesson of the book is rather that any failure of sight, especially in mid-life, may be a symptom of glaucoma and that the only safe course is to consult an oculist at the earliest moment.

It is also pointed out that most other causes of blindness after mid-life can be held in check if there is prompt medical attention and the closest coöperation between patient and doctor.

Among the other causes of blindness after mid-life briefly discussed are degenerations or new growths in either brain, optic nerve, or eyeball, of course including the one most commonly known, cataract. LEWIS H. CARRIS

Protozoölogy. *A manual for medical men, veterinarians and zoölogists—By C. M. Wenyon, Director-in-Chief of the Wellcome Bureau of Scientific Research. New York: Wood,* 1926. Vol. 1, 1–778 pp.; Vol. 2, 779–1563 pp., 20 col. pl., 565 figs. Price $25.00.

The rapid growth of knowledge in the field of protozoölogy in the last quarter of a century succeeds in chronology and parallels somewhat in importance the rise of bacteriology in the last quarter of the preceding century. Its place and importance in pathology and medicine are beginning to be appreciated, but it can hardly be said to have "arrived" as yet in the medical profession at large. The prevalence of parasitic infections of man in the tropics has given a sense of remoteness of these plagues of humanity in the minds of practitioners in temperate climates. The bacteriological flare has also so dominated the picture of disease in current-day opinion that the chronicity of and tolerance of the body to parasitic infections seem to diminish their significance and importance in medical education and practice. Thus the two principal protozoan infections of man, malaria and amebiasis, carry in the minds of most practitioners and in medical education the tropical connotation, though both will be encountered in the everyday practice of most physicians in our own land.

Travel and the steady and ever increasing relations of occidental civilization to the tropics on which we depend so largely for sugar, vegetable oils, bananas, coffee, tea, and rubber, multiply opportunities for the entry in our country of both the well-known and the rarer protozoan infections of man from these regions where sanitation is undeveloped and endemicity high.

For these reasons, if for no other, Dr. Wenyon's extensive monograph is a most useful and important contribution to the subject of protozoölogy in its relations to infection and disease. The mere volume and complexity of the data, and the evolution of protozoan infections up the scale of animal life is both dramatic and impressive. Even the plants are not to be excluded from attack for their lactiferous tissues afford an inviting medium for the growth of parasitic and in some cases pathogenic flagellates, while certain investigators have reported amebae also from plant tissues.

Dr. Wenyon's book is written primarily from the standpoint of the protozoan organism rather than the relations to the host, pathogenicity, or therapeutics. It deals with the morphology and life cycle of the protozoa parasitic in different animals and plants, as well as man, although the human aspects are dealt with *in extenso*, for they are the best known and of most importance. The subjects of intestinal infections and the hematozoa of man and other vertebrates fill nearly a third of the book.

A section of the work is devoted to the spirochetes, not because the author, or indeed any protozoölogist of to-day, regards them as protozoa rather than bacteria, but because some of them have insect vectors and they often fall within the scope of operation of the protozoölogist dealing with disease. They often occur with the protozoans in the same organs and tissues and the technic of their study in the laboratory and in culture animals has much in common with that of the protozoa.

The author has done a real service to systematic zoölogy in his inclusion of a chapter on zoölogical nomenclature. Had medical men observed these rules there never would have been described over a hundred different species of human intestinal amebae. It would have been distinctly helpful if the author had included a reference to the published lists of genera such as those of Agassiz, Scudder, Sherborn, and the new Berlin list.

A chapter on the technic of protozoan investigation dealing with methods of fixing, staining, culturing, maintenance in culture animals, and dissection of mosquitoes and tsetse flies, contains many useful hints, although omitting some important procedures.

There is a very useful host index of the blood parasites of the vertebrates and their insect vectors, with literature citations. The fact that this fills 61 closely printed pages is indicative of the extent to which parasitism of the favorable medium of the blood has been utilized in nature by invading protozoa. And the end is not yet, for it appears that few, if any, vertebrate species escape such infections, and these are often multiple—witness the barn owl with at least three to his credit.

The exceedingly useful bibliography contains about 3,500 titles, with some notable omissions, such as the monographs of Leidy and Penard on the Rhizopoda and Roux on the Ciliata.

This monograph is essentially a compilation from the vast volume of output of protozoölogists, mainly in recent years. It is at its best in the discussion of trypanosomes and other hematozoa. This is a field of great confusion

and complexiey. Dr. Wenyon's monograph will do much to make later work more precise on essential features of morphology and life history. A full discussion of the serological relations and therapeutics of the trypanosomes comparable with that which he has given of the systematics, morphology, life cycle, and occurrences, would have been of great value to the medical and pharmaceutical applications of protozoölogy and serology.

In comparison with leishmaniasis and trypanosomiasis, malaria seems to have received from our author less able and complete treatment. One must turn to the recent handbooks of tropical medicine for this. Possibly the authors predilection for the zoölogical rather than pathological aspects of his subject is reflected in this. Plasmodium and its relatives in other vertebrates than man, seems not to have attained the wide extension and diversification that the more primitive group of flagellates has evolved.

Zoölogists and medical pathologists are under obligation to Dr. Wenyon for this much needed assembling of the accumulated facts regarding parasitic protozoa by one widely familiar with this extensive field. They will find here a fairly complete presentation of the English and German investigations, a less complete and less receptive one of the French and American work. For the morphological interpretation and broader biological significance of the data in this basic and fundamental group of animals, we must still turn to the classic works of Minchin, Doflein, and Calkins.

For the data of the systematics, distribution, structure, life-history, host relations, and medical significance, the work is an indispensable mine of information for every worker in this field. It is assembled in an orderly fashion, splendidly illustrated, and well indexed.

CHARLES A. KOFOID

The De Lamar Lectures, 1925–1926—*Baltimore: Williams & Wilkins*, 1927. 220 pp. Price, $5.00.

The De Lamar Lectures on personal and public hygiene are intended to be more or less popular in character. The present volume contains thirteen of these lectures, each one by a specialist in his particular line.

A book of this sort does not lend itself readily to review, and it would be invidious to select certain of the papers for special mention. Fortunately the material contained in these essays has been published elsewhere as well as in this book, though in the excellently made up volume we have a depository which will make an addition to any library. M. P. RAVENEL

The Harvey Lectures, 1925–1926—*Baltimore: Williams & Wilkins*, 1927. 229 pp. Price, $4.00.

The Harvey Lectures for 1925–26 were all given by well-known authors and as far as they go represent the recent notable contributions to medical science. Three of the numbers are by European investigators, all of them of excellent character. The entire number, however, maintain the established reputation of this series of lectures and of the society under whose auspices they are delivered.

The printing and makeup of the book are excellent. M. P. RAVENEL

Your Hair and Your Health and **The Care of the Face**—*By Oscar L. Levin, M.D., Chief of Clinic, Cornell University Medical College; Director of Dermatology, Beth Israel Hospital. New York: Greenberg*, 1926 and 1927. 163 pp. and 225 pp. Price $2.00 each.

These books are on closely connected subjects and there is necessarily a considerable amount of duplication. Both are written in non-technical language adapted for the average reader of intelligence.

The first book emphasizes the dependence of the hair upon the general health, and shows that it is oftentimes an indicator of constitutional disturbances, holding to the canon of the French school of dermatologists which emphasizes the relation existing between the hair and the rest of the body, as distinguished from the Viennese school, which has depended largely upon local applications. The keynote of the book is contained in the statement, "* * * healthy hair needs a healthy constitution." It ends with 20 pages of *Questions and Answers* which not only teach facts, but combat many widespread superstitions.

The Care of the Face is devoted to the dermatology of the face alone, though it emphasizes the important fact that the skin is an organ and not merely a covering. It describes the structure of the skin and its functions and describes the care which it deserves. It points out by striking examples the dangers of quackery, the impossibility of feeding the skin from the outside, and of doing other things which are

claimed in advertisements by many professors, beauty shops, and dermatological institutes, there being in New York City alone, some 1,700 places in which beauty is dispensed and ugliness dispensed with. The book ends with a glossary which is useful, but not nearly so good as the *Questions and Answers* of *Your Hair and Your Health.*

Both volumes are liberally illustrated by rather crude woodcuts, though for the most part they carry the message desired. These books are characterized by their humor, their practicality and common sense, and we hope they will reach a wide circle of feminine readers in this age of wild rushing after false standards of beauty. M. P. RAVENEL

Overcoming Tuberculosis: An Almanac of Recovery—*By Gerald B. Webb, M.D., and Charles T. Ryder, M.D. New York: Hoeber,* 1927. 80 pp. Price, $2.00.

The intelligent person who is informed that he has tuberculosis shortly weathers the first stunning shock and then settles down to the serious but not uninteresting business of pursuing the "cure." One of his early needs is a written guide to supplement the specific instructions of his physician. But the tuberculous patient is sick psychically as well as physically. He must be warned of possible dangers, but not frightened. He is entitled to a frank statement as to the nature of the disease but should not be permitted to delve introspectively into his own pathology. He may be lightly cajoled but not deceived. What to say to him and what to leave unsaid require a nicety of judgment which only long experience and a personal appreciation of the emotional processes which influence the victim of tuberculosis can give.

This book is to be commended for its cheerful, serene style, for its poise of statement and for the simplicity and straightforwardness of its instruction. Instead of stirring up brooding curiosity, it inspires hope; strengthens the determination to get well; and supplies sensible hygienic advice. Yet it is singularly free from insipid "Pollyanna" platitudes.

The unique feature of the book is that it is both a manual of instructions and a personal record. About one-half of the book consists of text while the other half contains blank ruled charts sufficient to keep a 2-years' record of temperature, pulse, weight and general conditions. Apt quotations and aphorisms adorn the margins of the charts. Whether or not a patient should keep his own temperature and pulse record may be debatable, but experience seems to indicate that an intelligent patient, especially one who is not neurotic and whose prognosis is hopeful, may well be trusted with this task. He finds that certain indiscretions reflect themselves on the record, he is encouraged by evidences of improvement and unconsciously he learns to reorganize his life on a basis compatible with his pulmonary disability.

This book is the third revision of a very popular first edition which was exhausted in less than two years. It is neatly printed and substantially bound. H. E. KLEINSCHMIDT

Hygiene and Sanitation: The Essentials of Modern Health Care—*By Jesse Feiring Williams, M.D., Professor of Physical Education, Teachers College, Columbia University. Philadelphia: Saunders,* 1927. 344 pp. Price, $2.00.

The author has a well established place as a teacher of hygiene and as a writer on the subject of health. This latest book will sustain a well earned reputation. He points out that the maintenance of health depends upon two chief factors: one, the effort of the individual, and the other, the combined efforts of many individuals expressed through community and governmental control. The latter may be described as the chief advance which has been made in the practice of modern hygiene. With the increase in the control of public utilities, such as water and milk, we have come to depend more and more upon health officers representing the government. The individual can overcome some defects of governmental control, but is not apt to do so in the absence of special training. The author emphasizes the relationship between the two throughout the book.

The chapter on the Health Care of One's Self is especially good. Successive chapters give excellent advice to the expectant mother, the care of babies and young children, of older children, and finally of the aged, infirm and invalid. Other chapters treat of the home, the factory, the city, the state and the nation.

The book is designed for teaching purposes, each chapter ending in a series of "Questions and Practical Exercises." At the end of the book collateral readings arranged by chapters are given which are mostly well selected. It is abundantly illustrated and contains reproductions of a number of charts and score cards used by various health organizations.

The printing and makeup of the book are excellent. An enormous amount of correct information is given in the 300 pages of text. The book can be thoroughly recommended to teachers as well as to others who desire a concise statement of the principles underlying the preservation of health. M. P. RAVENEL

Health Problem Sources—*By Marion Olive Lerrigo. Contributions to Education, No. 224. Bureau of Publications, Teachers College, Columbia University,* 1926. 151 pp. Price, $1.50.

This study, conducted under the inspiration of Dr. T. D. Wood, is an admirable example of the new pedagogy which is at last beginning to obtain solid objective data as to the ideal subject matter of the curriculum. Dr. Lerrigo has analyzed with careful discrimination a series of standard publications in the field of public health (such as the *Annual Reports of the Surgeon-General of the United States Public Health Service,* the report of the Committee on Administrative Practice of the A.P.H.A. and the like) and has derived from them a list of 10,000 distinct problems which appear to be of importance in the actual health field. These problems were grouped, and the groups ranked in order of importance according to the attention they received in the literature studied. It was then determined how far emphasis in certain school hygiene texts and courses of study coincided with emphasis in the practical health field.

There are obvious limitations to such a method of study; but Dr. Lerrigo understands them and points them out. Her monograph should be of the greatest value to curriculum makers, writers of textbooks and teachers of hygiene. It is one of the most helpful of the many excellent monographs which have come to us from Teachers College.

C.-E. A. WINSLOW

Eating for Efficiency—*By Meta H. Given. Chicago: Evaporated Milk Association,* 1927. 64 pp. Free.

With the market flooded by more or less costly books on how to eat, many of them by faddists, it is refreshing to encounter this sane, and sound, booklet on nutrition, even though it is obviously produced in the interests of evaporated milk. This form of concentrated milk is, however, the equal of whole milk in practically every respect, besides having some special advantages, such as safety and superior digestibility, not always possessed by whole milk supplies. Daily menus for the preschool, school, adolescent, and adult periods are presented, with 20 pages of useful recipes. This book will prove of value to anyone interested in good nutrition and ought to have a wide distribution. J. A. T.

A Synopsis of Hygiene—*By W. Wilson Jameson, M.D., D.P.H., Lecturer on Public Health and Preventive Medicine, Guy's Hospital Medical School, Medical Officer of Health, Hornsey, and F. F. Marchant, M.R., San. Inst., Senior Assistant, Department of Hygiene, University College. (2d ed.) 21 ill. London: J. & A. Churchill,* 1927. 514 pp. Price, $5.00.

This book is frankly intended for those studying for the diploma in public health in England, and much that it contains is not adapted to American students, since it refers specifically to the acts under which the Ministry of Health and other sanitary authorities in England operate, though needless to say, one can learn much by the study of excellent laws in force in other countries.

Like other English books, considerable attention is given to meteorology, the chapter on which goes into considerable detail—such as the manufacture of thermometers and barometers. We have failed to find any subject upon which the health officer needs information which is not adequately treated, and the information is exact and up to date. Some 60 pages are devoted to chemistry, physics, and formulae for the calculation of diffusion of gases, ventilation, flow of water, sewage effluents, etc., and tables which the engineer often uses. There are two appendices, one of which gives the analyses and food value of ordinary food stuffs, as well as the latest table of vitamin content, while the second gives instructions concerning the diploma in public health, naming the schools, laboratories and hospitals recognized by the authorities as suitable for instruction.

The book is well written and well printed, and contains an enormous amount of accurate information. Very few errors have been detected. M. P. RAVENEL

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Teaching a Health Habit—The educational propaganda of an insurance company designed to increase the consumption of water is given as an example of one factor in emphasizing the importance of safe water.

ARMSTRONG, D. B. Eight Glasses a Day Keep the Doctor Away. Water Works Eng., 80:17 (Aug. 17), 1927.

Mosquito Larvicides—A patented preparation of paraformaldehyde, called "Stoxal," which had been recommended as a larvicide, was tried and found less effectual than Paris green. The latter is believed to be a satisfactory larvicide for Anophelene mosquitoes.

BARBER, M. A., and KOMP, W. H. W. Some Tests of the Larvicide "Stoxal." Pub. Health Rep., 42:31 (Aug. 5), 1927.

Diphtheria Immunization—The fervor with which this British writer adjures his fellows to undertake the general immunization of children against diphtheria will have a strange sound to American health workers who have for some time taken general diphtheria prophylaxis for granted.

BRINCKER, J. A. The Case for Diphtheria Immunization. Pub. Health, 40:11 (Aug.), 1927.

Underweight Children—A study of a very large number of underweight children in Massachusetts indicates that underweight appears to have little relation to hilum tuberculosis infection. Among exposed children, half become infected before 7 years of age. Pulmonary tuberculosis is two to three times as common among girls as in boys.

CHADWICK, H. D. Observations in the Underweight Clinics in Massachusetts. J. A. M. A., 89:9 (Aug. 27), 1927.

Heart Disease Prevention—The clinic, hospital, and school facilities for the care of cardiac patients in New York City is described in a discussion of the program of the American Heart Association and its branches.

CONNER, L. A. The Rehabilitation of Cardiac Patients Through Organized Effort. J. A. M. A., 89:7 (Aug. 13), 1927.

Preventing Pyorrhea—Constant irritation of the gums by the bristles of the toothbrush (which are always septic), in this author's opinion is the predisposing cause of pyorrhea. He suggests as a preventive that the brush be kept immersed in an antiseptic (carbolic 1:20) between times of use. How the sterility of the brush can affect the gums, which are never sterile, is not quite clear.

DONOVAN, F. D. The Prevention of Pyorrhea. Lancet, 2:4 (Jul. 23), 1927.

Hygiene in Private Practice—The suggestion is made that a "check list of opportunities for domestic health practice," to be prepared by the U. S. Public Health Service, might stimulate more active participation in the promotion of health by practicing physicians.

DRAPER, W. P. The Unexplored Field of Preventive Medicine in Private Practice. J. A. M. A., 89:7 (Aug. 13), 1927.

Maternity and Infant Welfare—The work of St. Thomas's Hospital, London, is described as an illustration of the way in which maternity and infant welfare clinics should be tied up with practicing physicians and midwives, on the one hand, and the local health department on the other.

FAIRBAIRN, J. S. The Coördination of Maternity and Child Welfare Work with Hospital Services. Pub. Health, 40:11 (Aug.), 1927.

Effect of Ultra-Violet Radiation—The usual exposure to ultra-violet radiation appears to have little immediate or lasting effect upon basal metabolism in children.

FRIES, M. E. Effect of Therapeutic Doses of Ultra-violet Radiation on Basal Metabolism in Children. Am. J. Dis. Child., 34:2 (Aug.), 1927.

Dental Focal Infections—The need is stressed for a better understanding between dentists and physicians in regard to focal infections in the oral cavity. How such infections are to be treated and what results may be expected is far from a simple matter.

GOLDBERG, H. A. Dental Infections. J. A. M. A., 89:5 (July 30), 1927.

Light Treatment—What may be expected from light treatment? To expect it to be a cure-all for "surgical" tuberculosis, or to employ it to the exclusion of other hygienic measures is to bring it into disrepute. A summary of the value of sunlight and artificial lights is included.

MAYER, E. The Fundamentals and the Clinical Aspects of Light Treatment. J. A. M. A., 89:5 (July 30), 1927.

Plague **Control**—Rat proofing of vessels is advocated as the most effective method of preventing the transportation of rats which carry with them the flea that transmits the plague to man. The inefficiency of other measures is discussed.

GRUBBS, S. B. Bubonic Plague and Maritime Quarantine. Pub. Health Rep., 42:32 (Aug. 12), 1927.

Preventing **Lead Absorption**—This paper describes the industrial hazards in the storage battery industry and the steps taken to prevent absorption, both in this country and abroad. A very full and complete account of this important hygienic program.

HAMILTON, A. The Storage Battery Industry. J. Ind. Hyg., 9:8 (Aug.), 1927.

Nasal **Infections and Pools**—The author reports many nasal infections spread apparently through the water of swimming pools. He quotes experimental evidence to indicate the possibility of the transmission of such infection, but fails to say whether adequate chlorination prevented such transmission.

HASTY, F. E. Paranasal Sinus Infection and Swimming. J. A. M. A., 89:7 (Aug. 13), 1927.

Irradiated **Foodstuffs**—Irradiated dried milk, cholesterol (to be added to cod liver oil), and dried brain substance were all found to be valuable in infant feeding as rickets preventives. Irradiated yeast also proved of value.

HESS, A. F. Antirachitic Activity of Irradiated Cholesterol, Ergosterol, and Allied Substances. J. A. M. A., 89:5 (July 30), 1927.

Pertussis **Vaccines**—Judging by the power to stimulate the production of demonstrable antibodies in rabbits, properly stored pertussis vaccine remains potent for years. This finding appears to contradict the usual claim that such vaccines lost potency after two or three months.

MISHULOW, L., et al. Potency of Stored Pertussis Vaccines. J. Infect. Dis., 41:2 (Aug.), 1927.

Stream **Pollution**—The importance of joint action by state health departments to prevent stream pollution is discussed. The possibilities for good in such coöperation are unlimited.

MONGER, J. E. Interstate Control of Stream Pollution. Nation's Health, 9:8 (Aug.), 1927.

Rabies **Control**—A survey of the status of rabies, and preventive measures adopted throughout the country, precedes a discussion of the feasibility of canine prophylactic inoculation. The author's decision is that the efficacy of the latter procedure is not sufficiently well established to warrant its adoption as the sole preventive measure to be adopted by governments.

MOORE, V. A. Rabies and Its Control. N. Y. J. Med., 27:16 (Aug. 15), 1927.

Foot Hygiene—The importance of knowledge of the normal and anomalous foot in making and fitting shoes is stressed. The foot will tolerate much abuse but in the long run abuse will have its effect.

PAINTER, CHARLES F. Shoeing Problems and the Human Foot. Boston M. & S. J., 197:7 (Aug. 18), 1927.

Institutional Care of Cripples—This is an interesting account of the planning, building, and management of a sea-side solarium for crippled children at Vancouver Island, British Columbia.

RAVENHILL, A. The Queen Alexandria Solarium for Crippled Children. Nation's Health, 9:8 (Aug.), 1927.

County Health Work—A matter-of-fact account of the administrative details of a county health department in West Virginia which hitches its wagon to a star. Evidence is not presented to show that it has attained the goal of its motto, but the will to achieve is very evident.

SELBY, V. A. Harrison County the Healthiest in West Virginia. Nation's Health, 9:8 (Aug.), 1927.

Preventive Medicine—The presidential address at the British Institute of Public Health urges the need for "looking to the end" in developing a public health program, and the importance of the social aspects of preventive medicine.

SMITH, W. R. Preventive Medicine and the Modern State. J. State Med., 35:8 (Aug.), 1927.

Vitamin Requirements—If a portion of the minimum amount of vitamin B, necessary to sustain life of nursing rats, when fed to the mother is fed directly to the young rats by means of capillary pipettes, less than the remainder of the minimum amount need be fed to the mother in order to keep the litter in health. The effect of this principle in human nurslings is to be discussed in a future paper.

SURE, BARNETT. Vitamin Requirements of Nursing Young. J. A. M. A., 89:9 (Aug. 27), 1927.

Illness Rates and Sex—Another of the Hagerstown morbidity studies reveals interesting sex differences in illness rates. Except below the age of 10, the female rates exceed the male. The greatest difference is at the 30-

year period—the difference growing smaller thereafter.

SYDENSTRICKER, E. The Illness Rate Among Males and Females. Pub. Health Rep., 42:30 (July 30), 1927.

Massachusetts Health Administration—The history of the development of health administration in Massachusetts precedes a description of the present health department activities.

TOBEY, J. A. Public Health Administration in Massachusetts. Boston M. & S. J., 197:7 (Aug. 19), 1927.

Concentrated Milk—Condensed, evaporated, and dried milks are free from pathogenic organisms, the nutritional properties are unimpaired, they are more digestible, and keep longer. That they have many advantages over whole milk is the contention of the author.

TOBEY, J. A. The Public Health Value of Concentrated Milk. M. J. & Record, 124:4 (Aug. 17), 1927.

Russian Health Administration—An American observer visits a Russian government health unit in Moscow and finds many novel and interesting ideas incorporated in the health program, particularly in health educational activities. This should be read by all health officials.

WARNE, C. T. Government Public Health Work in Russia. Nation's Health, 9:8 (Aug.), 1927.

Children's Coffee Habits—In Pittsburgh, public school children were found to drink on the average 1.47 glasses of milk and 0.8 cups of coffee, whereas the parochial school children drank 0.9 glasses of milk and 1.52 cups of coffee. The coffee drinking children were found to have lower scholastic standing than the others, but the condition may have been due to other factors in addition to coffee drinking.

FETTERMAN, J. C., et al. Coffee and Milk Drinking Habits of School Children. Nation's Health, 9:8 (Aug.), 1927.

Rheumatic Fever and Industry—The rôle of rheumatic fever as a handicap to industrial management is stressed, and the need for preventive measures as a part of the industrial hygiene program is urged.

WILLCOX, W. Chronic Rheumatism in Its Relation to Industry. J. Royal San. Inst., 47:2 (Aug.), 1927.

Statistical Facts and Fancies—The abuse of statistical data is inveighed against in this excellently presented statement of the use of vital facts. Their use is considered from the standpoints of demography, administration, and epidemiology.

WILSON, E. B. The Public Health Significance of Vital Statistics. Nation's Health, 9:8 (Aug.), 1927.

Cancer Prevention—A descriptive paper on the prevention and treatment of cancer delivered to a lay audience. Immediate reporting for medical diagnosis is urged upon all persons with suspicious lumps or sores. Mechanical irritation and toxemia are the causes assigned. Well presented.

WRIGHT, A. H. Cancer. M. J. & Record, 124:4 (Aug. 17), 1927.

BOOKS RECEIVED

MOTHER INDIA. By Katherine Mayo. New York: Harcourt, Brace, 1927. 440 pp. Price, $3.75.

REPORTS ON PUBLIC HEALTH AND MEDICAL SUBJECTS. Bulletin No. 35. Some Administrative Aspects of Scarlet Fever. By Allan C. Parsons, M.R.C.S. London: His Majesty's Stationery Office, 1927. 369 pp. Price, $1.80.

MENTAL HANDICAPS IN GOLF. By Theo. B. Hyslop. Baltimore: Williams & Wilkins, 1927. 112 pp. Price, $1.50.

HANDBOOK OF INFORMATION AND SUGGESTIONS ON PUBLIC HEALTH NURSING FOR CHAPTER COMMITTEES ON NURSING ACTIVITIES AND RED CROSS PUBLIC HEALTH NURSES. Part 1. Washington: American National Red Cross, 1927. 54 pp.

POTASSIUM AND TARTRATES. A Review of the Literature on Their Physiological Effects. By Ralph W. Webster, Ph.D., M.D. Chicago: Commonwealth Press, 1927. 168 pp. Price, $2.50.

THE BACTERIOLYTIC TANK SYSTEM IN SOUTH AUSTRALIA. By W. Ramsay Smith, M.D., D.Sc., F.R.S. 7th ed. Adelaide: Government Printer, 1927. 74 pp.

THE HISTORY OF THE INCANDESCENT LAMP. By John W. Howell and Henry Schroeder. Schenectady: The Maqua Co., 1927. 208 pp.

NOXIOUS GASES AND THE PRINCIPLES OF RESPIRATION INFLUENCING THEIR ACTION. By Yandell Henderson and Howard W. Haggard. American Chemical Society Monograph Series. New York: Chemical Catalog Co., 1927. 220 pp. Price, $4.50.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

United Fruit Company—Public health workers, especially students of tropical medicine, will find the 15th Medical Department Report of much interest. One section, devoted to malaria control measure, includes both clinical observations and treatment experiences. In the company's experience malaria is said to be the most prevalent and of the greatest economic importance in relation to labor efficiency of any of the endemic diseases. It is directly responsible for from 38 to 40 per cent of all hospital admissions. Brief experience in the use of plasmochin compound as a therapeutic agent in the treatment of malaria and in the prevention of its spread is reported favorably. "We recommend that the blood films of all cases of malaria under treatment in the hospitals and in the hospital dispensaries be examined by the thick film method before discharge and, if parasites remain, that a course or courses of plasmochin compound be reported until the peripheral blood is found to be negative."

An enlightening section deals with the diagnosis of intestinal amoebiasis and emphasizes the pitfalls in laboratory technic. Those interested in the classification of bacterial dysenteries and of dysentery bacilli will find an article by Castellani worthy of study. A report on lobar pneumonia treatment incidentally points out that this disease was responsible for 23 per cent of the hospital mortality during 1926, with 63 cases and 23 deaths.

One of the most interesting sections is devoted to syphilis in the tropics, with case reports and photographic illustrations. This includes an analysis of positive Wassermann reactions found associated with various diseases in one of the hospitals, a comparison of the Wassermann reaction and Meinicke's turbidity reaction, and a comparison of the latter test with the Kahn precipitation test. The entire report abounds in excellent illustrations and detailed statistical tables. It contains a table of contents at the front and an alphabetical index, at the back. It is well printed in good readable type.

Demonstrating Child Health—This 44-page report from the Commonwealth Fund reviews the work of the child health demonstrations, 1923–1927. Good printing, effective graphs, and interesting text are outstanding characteristics. Gratifying progress in the gradual assumption of health administration activities by official agencies is recorded.

Local appropriations for health work increased in Fargo from 88 cents per capita in 1922 to $1.20 in 1926; in Marion County, from 14 cents in 1924 to 26 cents in 1926; in Rutherford County, from 10 cents in 1923 to 28 cents in 1926; and in Clarke County, from 71 cents in 1923 to $1.26 in 1926.

Very effective cuts indicate the services rendered in the different communities in 1926. These show graphically that in Fargo, for example, (where the demonstration is coming to a close), out of every 10 infants, 3 were examined by a pediatrician and 7 were visited by a nurse; out of every 10 preschool children, 1 was examined by a pediatrician and 6 were visited by a nurse; out of every 10 school children, 6 were examined by a pediatrician and 6 were visited by a nurse; out of every 10 homes, 5 were visited. All school children were taught good health habits and a large proportion received dental care. For the period 1923–1926, the infant mortality rate in Fargo was 56.2, the maternal mortality rate, 4.0.

For each demonstration are given the staff, the most important vital statistics, the chronology, and the public health expenditure. Anyone interested in health administration and health education will find this carefully prepared report of considerable value.

New Orleans Hospitals and Clinics—A mimeographed report has recently been made of a study of the hospitals and clinics of New Orleans, La. This study was conducted under the auspices of the health committee of the Council of Social Agencies. It embraces an analysis of expenditures, income, and services rendered. Comparable figures from several cities, as a result of a study by the American Association of Community Organizations, are included.

Among the important findings, it is noted that New Orleans ranks third in a list of 20 cities, in the number of hospital beds available. These beds, however, are not used to capacity (63.4 per cent). It is emphasized that the best criterion for use in considering this problem is not total utilization but the rise and availability

of beds in relation to different purposes. The need for careful studies of existing resources and potential demands by groups interested in hospital development, before definitely adopting a program, is made apparent. The total amount of free service (71.4 per cent of total days of care) to the sick is one of the striking facts of the study.

Of the 15 hospitals in the city, 8 operate a clinic, or outpatient department. In addition, there are neighborhood clinics of the Child Welfare Association, a special tuberculosis clinic of the Orleans Anti-Tuberculosis Association, a neighborhood clinic at a community center, and a clinic of the board of health. In general these are free services, although three of the organizations charge a 25 cent registration fee from those able to pay, and two others a 10 cent fee. Two other organizations have a scale of charges for different services. Approximately one out of every 2.6 persons in the city were registered at clinics or dispensaries during the year ending July 31, 1926.

New Britain, Conn.—The 1926 report of the superintendent of health shows for this city of 70,000 people an infant mortality rate of 79.7, and a general death rate of 9.1. During the year a municipal abattoir was completed and this indicates an important progressive step. Accounts of laboratory examinations, dental clinic activities, nursing and inspection procedure, together with an account of a special drive for reporting of measles cases make up the body of the report. Expenditures amounted to $51,930, of which $22,583 were expended for garbage collection.

Athens Child Health Demonstration—In an attractively arranged ten-page pamphlet, the Athens (Ga.) Child Health Demonstration gives an interesting account of its work for 1926. The cover shows a picture of a rough-and-ready youngster whittling a piece of wood, under which is the key word of the report—"Natur'l." The report is interspersed with numerous photographs of nurses, parents and children at the Health Center and schools, and contains several typical examples of case work carried on by the Demonstration. Health has been made a reality in the homes of 1,305 Athens school children during 1926, while 1,503 calls were made by Athens and Clarke County nurses on patients with infectious diseases. Six hundred and eighty-one visits were made by nurses to expectant mothers in Clarke County, 791 Athens and Clarke County babies and "runabouts" were enrolled in the 9 health centers, and 885 visits gave nursing care to 156 mothers with new babies in Athens. "Teaching health, preventing sickness, giving skillful care at need, sometimes saving life—this is the work of the 6 public health nurses now on duty in Athens and Clarke County—one nurse for each 900 families."

Chelsea, Mass.—Chelsea's 34-page report of the board of health for 1926 is printed on good soft paper and bound in attractive light blue covers, the front cover bearing the city seal. An organization list of the personnel appears at the front followed by a summary statement by the board of 3 members.

Based on a population of 47,247, a crude death rate of 13.3 (corrected for residence, 8.02) is recorded. Deaths of infants under 1 year of age numbered 58, a decrease of 21 from the previous year. Expenditures, exclusive of $17,500 for offal, amounted to $32,962. Of 9,661 school children inspected, 3,068 were reported normal, while defects corrected numbered 4,060.

Cattaraugus County, N. Y.—Health officers and their associates will find the 1926 report of the board of health and the health demonstration of unusual interest. This report presents in 107 pages the outstanding features of the year's work, combining attractive illustrations, essential statistical tables, and descriptive text in a well balanced, logically arranged report. In many respects it may well serve as a model health report.

Following a well arranged title page, illustrating good type usage, one page is devoted to a list of coöperating agencies, another to personnel of local health districts, followed by a three-page foreword by the President of the board. This statement gives certain high lights of the report and indicates expenditures of $28,030 equally by the local board of health and the state in addition to $97,000 from the Milbank Fund.

A table of contents outlines the sections of the report and suggests a well rounded program. Addenda show the cost of automobile operation, a partial list of visitors, publications and addresses. An excellent organization chart pictures the administrative plan of the official department. Photographs are distributed in appropriate places throughout the report to illustrate various lines of activity described in the text. There are no long statistical tables,

with many blank spaces, but effective summary tables and charts.

A birth rate of 1,903, a general mortality rate of 14.5, and an infant mortality rate of 67 were recorded. Twenty-seven per cent of the population under 10 years of age has been immunized against diphtheria. "The Schick test before immunization has not been used, as evidence is abundant that in rural and semi-urban areas practically every child is susceptible." The tuberculosis program has attracted much attention. During the year 55 per cent of all positive cases of tuberculosis coming to the clinics of the county health department were referred by physicians. A morbidity survey, in which 17 physicians are coöperating, is under way. The county sanatorium has a capacity of 50 beds. Lack of space prevents reference to several other interesting sections of this report, which deserves careful study.

Texas Water Works School—The proceedings of the 9th Texas Water Works short school held in Dallas, January 24–29, 1927, occupy 397 printed pages, of special interest to sanitary engineers. A perusal of these proceedings indicates that many papers were presented at this annual gathering, of practical benefit to the operator, the chemist, the administrator and to the general public. A total of 295 persons were registered, including several leading sanitary experts from outside the state.

This plan of a school was developed nearly 10 years ago with the idea of giving water works men practical suggestions and assistance in their work, leading to better water supplies in the state. The results reported are gratifying in showing the progress which has been made. Sections of the report deal with various problems of water supply, including modern analytical and treatment methods; sewage disposal problems and treatment methods; and the use of the standard milk ordinance.

Baltimore, Md.—Baltimore's 1926 report of the health department occupies 296 pages of text and tabular material, bound in light gray paper covers and printed in good readable type. The city seal which appears in the center of the front cover bears the date 1797. Commendable features include a table of contents at the front, an alphabetical index at the back, and statements of population, birth, and general death rates in the opening paragraphs of the Commissioner's letter to the Mayor and City Council.

This city of 807,654 population reports a birth rate of 20.4, a death rate of 15.1 (colored 25.0; white, 13.4), and an infant mortality rate of 82.5 (colored 127; white 71.1). Emphasis is given especially to the importance of child welfare work, tuberculosis and venereal disease control. The laboratory reports indicate that research work is encouraged and several publications have resulted. Immunization work begun in 1922 has resulted in the protection of 43,317 persons of whom over 36,000 are children under 15. The last 172 pages of the report are devoted to detailed statistical tables, some of which show comparative data for previous years.

Athens and Clarke County, Ga.—In the small space of 20 pages, the Athens department of health report contains much information and several commendable features. The report is well printed in good type on soft paper, and is easily read. Several excellent graphs with descriptive text, add interest and clarity to one of the best reports of the year.

A financial statement shows an expenditure of $19,462, of which nearly $16,000 was for salaries. Appraisal form scores of four years county health work are shown, graphically for each function and for all functions combined. This mode of presentation indicates at a glance the progress from year to year and is recommended for consideration by others preparing reports.

During the year there were no deaths from diphtheria. There were 42 cases of smallpox among persons who had not been successfully vaccinated. Athens has an ordinance requiring the vaccination of all dogs to prevent rabies, and a certificate from a veterinarian is required before a license tag may be purchased. An effective chart in the nursing section indicates that 3 out of 10 families were reached by nurses' visits in 1926. Exclusive of nonresidents, an infant mortality rate of 70 is recorded. The report concludes with an expectation of life table, showing for the whites at this time, 60 years, and for negroes, 42 years.

Pennsylvania Tuberculosis Society.—"Oldest Tuberculosis Prevention Organization in the World!" This notation on the cover of the 1926 yearbook causes the reader to pause before turning to the subject content. The Society was organized in 1892. Two excellent photographs of the tuberculosis exhibit at the Sesqui-Centennial Exposition add greatly to the attractiveness of the report and offer valuable

suggestions for any one planning a health exhibit. This exhibit consisted of 18 units of miniature stages, each of which showed some phase of tuberculosis work. Enlarged photographs formed the background and side panels. In the foreground were cut-out photographs. The back cover of the report is well utilized for a statement of fundamental measures in fighting tuberculosis.

From the President's report, it is learned that there are 4,266 beds for tuberculosis patients in state, city, county and private sanatoria. They treat about 10,000 cases a year, approximately one-half being treated in state sanatoria. In the state chest clinics, 20,646 patients were examined and cared for in 1926.

A steady increase in the Annual Christmas Seal sale is noted, amounting to about $550,000 for the year of the report. This enables the Society to participate in wider activities, including the support of important research.

Maine Public Health Association.—The 1926 report of this volunteer health organization is written in popular style and is obviously directed to these who support its work. The account covers a wide range of activities, including service to new and prospective mothers, clinic service to rural areas, health education service, county public health nursing, service to tuberculosis patients, to crippled children, and to the Maine Three-Quarter Century Club—"All for a Healthier and Happier Maine." The financial statement shows an expenditure of over $51,000.

Public health nursing visits numbered 10,892 to 4,953 rural homes, each visit requiring an average of approximately one hour. The 9 nurses traveled 27,586 miles during the year, but it should be noted that 3 of the nurses worked less than half a year and 4 others, only 9 months. Through the child health education service, over 30,000 boys and girls in 306 cities and towns, including every county in the state, were taught the importance of health through the daily health chores of the "Modern Health Crusade." Many of these were so proficient that they won national honors.

The Three-Quarter Century Club is a unique organization. The 1926 annual meeting was attended by 1,153 members, all of them more than 75 years of age, coming from 231 cities and towns. They were accompanied to the meeting by more than 5,000 relatives and friends. The total membership is in excess of 15,000. The secretary of the Club in 1926 issued to all the papers of the state a public account of his daily program for health, which corresponded in all essential respects, with the health promoting program of the Maine Public Health Association.

Winnipeg, Manitoba.—The medical officer of health of Winnipeg indicates at the beginning of his 1926 report, the most important statistics for the year, together with a detailed financial statement and a general account of health conditions in Winnipeg. Several tables and graphs are effectively used in this 135-page report.

On the basis of an estimated population of 197,125, a crude death rate of 8.61 and a birth rate of 22.54 per 1,000 population (excluding stillbirths) are recorded. An infant mortality rate of 70.65 per 1,000 live births is slightly higher than the rates for previous years which were 68 in 1925 and 67.8 in 1924. To reduce these figures further, it is emphasized that more attention must be paid to prenatal care and instruction, as at present the majority of infant deaths occur during the first week after birth and are due to such causes as prematurity and congenital defects. During 1926, 70.9 per cent of the births occurred in hospitals and maternity homes, while only 3.7 per cent of the live births were attended by midwives.

Following the medical officer's statement, appear those of the heads of various health department divisions. The chief dairy inspector reports an outbreak of milk-borne typhoid, consisting of 15 cases, where infection was attributed to a "carrier" on a certain dairy. The milk previously delivered raw was pasteurized and the persons on the dairy considered as possible carriers were discharged. A per capita consumption of 0.63 pints of milk for 1926 is of interest. Fifty-seven per cent of the daily milk supply is pasteurized, 41 per cent is raw from tuberculin tested cows, and 2 per cent of the milk is certified.

PUBLIC HEALTH NOTES

Committee for Health Service Among Jews—The Committee became affiliated with the New York Tuberculosis and Health Association September 12. Jacob A. Goldberg, Ph.D., who has been in charge of the committee's activities since the organization in 1921, will continue as secretary.

The Committee for Health Service Among Jews has been engaged in preventive health work among Jewish people in New York City since 1921. It has specialized in assisting various groups, such as trade unions, day nurseries, and settlement houses, to establish their own health services. It has emphasized the importance of periodic health examinations with adequate follow-up care. Its work has been closely related to that of the New York Tuberculosis and Health Association which carries on an extensive program of health education and health service in the city of New York.

The work will be conducted on a non-sectarian basis, in accordance with the policy of the New York Tuberculosis and Health Association.

American Social Hygiene Association—The annual Regional Conference on Social Hygiene for 1927 will be held in Kansas City, October 10, 11, 12. The American Social Hygiene Association hopes to provide a forum from which issues may be clarified, progress noted, and available resources brought to the attention of the club woman, the religious leader, the public health official, the physician, the educator, the police official, the social worker, and that growing body of forward-looking men and women who wish to act now to insure a better world to-morrow.

The committee has planned for a large number of round tables and discussions on individual and community problems for specialists in various phases of social hygiene work. The general theme of the program for the first day will be Social Hygiene Education, for the second, Health, and for the third, Protective and Legal Measures in Social Hygiene.

Headquarters will be at the Hotel President.

New York State (Social Hygiene)—The 9th report of the social hygiene division for 1926 deals with educational measures, coöperation with physicians and druggists, clinic activities, and statistics. The report opens with a summary of achievements and comprehensive statements as to facilities and objectives in the control of venereal diseases. A symposium on syphilis for physicians was arranged during the year with the state medical association. The division has endeavored to get local health departments to accept their responsibilities for the educational program in their respective communities. It is noteworthy in this report that one page is devoted to "contemplated activities," for it is believed desirable that a report refer to future programs as well as to past experiences. There are also several effective charts, tables, and maps.

Texas Sanitarians' School—The 5th Texas Sanitarians' Short School is scheduled to meet in Houston November 1–4. This school is held under the auspices of the Texas Association of Sanitarians, the State Department of Health, and the respective cities at which the school is held. Being the first school of its kind to be instituted in the United States, it has attracted nation-wide attention, and has accomplished much in the practical training of sanitarians.

A tentative program is now being arranged under the direction of Dr. A. H. Flickwir, Houston, general chairman and director of the school; Dr. J. C. Anderson, State Health Officer; and Dr. L. H. Martin, President Texas Association of Sanitarians, from whom copies are obtainable.

Egypt Gets a Ministry of Health—A ministry of health has been created by a law recently passed by the Parliament of Egypt, according to a note in *Science* for August 5, 1927. Previously the supervision of public health work was under the Ministry of the Interior, but the health activities in this country have grown so rapidly that the new executive department was required.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D.P.H.

Milwaukee Health Department Organization—Dr. John F. Koehler, Commissioner of Health of Milwaukee, has published an outline giving the general organization of his health department. This publication is unique in that it portrays in simple language the organization of the various divisions and bureaus of the department, and states in simple language the purpose of each activity. There is an increasing tendency for health commissioners to abandon the voluminous annual report, crowded with tables giving details which are seldom needed, and substitute in its place a story giving the high points of the current year, such statistical data as is indispensable to the administrator, and a readable outline of the department's organization and activities.

The Milwaukee department is organized into 4 bureaus and 5 divisions. The Bureau of Child Hygiene is subdivided into the Division of Child Welfare and the Division of School Hygiene. The Bureau of Communicable Disease consists of 3 divisions, Epidemiology, Quarantine, and the communicable disease hospital. The third bureau is the Bureau of Inspection consisting of the Division of Food Inspection, the Division of Milk Inspection, and the Division of Sanitary Inspection. The last bureau is the Bureau of Laboratory, divided into the Division of Bacteriological Laboratory and the Division of Chemical Laboratory.

In addition to these 4 bureaus there are 5 other divisions. The Division of Nurses supplies all of the nurses employed by the Health Department that are engaged in assisting the various other divisions in their work. This division is conducted on the community or generalized plan. Previous to the fall of 1918 the health department nurses specialized in but one activity.

There is a Division of Tuberculosis charged with the supervision and care of tuberculous patients, and a Division of Venereal Disease which conducts clinics. The Division of Vital Statistics has charge of the records of births, deaths, and marriages. The Johnston Emergency Hospital cares for emergency cases arising within the city of Milwaukee.

Following a suitable introduction Dr. Koehler proceeds to discuss in detail the organization and purpose of each of his bureaus and divisions. His example may well be followed by other administrators. The pamphlet will answer many of the questionnaires which so frequently confront the health officer.

The Milwaukee Health Department has also prepared "A Guide for Principals and Teachers in Health Supervision in Schools" which describes the routine of morning inspection and gives in detail the manner in which the physical examination of the school children is conducted. The department aims to give physical examinations in the following order: kindergarten children, special cases, grades 1, 3, 5, and 8.

The Prevention of Diphtheria—The English Medical Research Council has recently issued a special report on the prevention of diphtheria prepared by Dr. J. Graham Forbes. The preface states that this report was originally prepared for the information of the Public Health Committee of the London County Council.

In outlining the progress made in the treatment and prevention of diphtheria it is stated that:

The antitoxin treatment of the disease brought down the case mortality quickly from 30 per cent to below 10 per cent, but since 1904 the decline, though continued has been only from about 9 to 7 per cent. During the whole time of the use of this life saving method, the attack rate and the virulence of the disease have been increasing. In London, for instance, between 1904 and 1924 the attack rate per 1,000 persons living rose from 11.2 to 19.1 and the deaths from 0.99 to 1.33.

The report discusses the use of the Schick test and states that its application, demanding as it does every care and accuracy of technic and experience in reading results, is conceived as outside the ordinary scope of the general practitioner, particularly in view of the time taken for observation, extending from one to four days. It is further stated that with a trained and experienced observer the test is a simple and reliable procedure attended by no harmful results. (It is hoped that as the general practitioner becomes better trained and

experienced the Schick test may be considered within his province.)

The report is not confined to English experience, but gives a summary of the preventive work which has been done in a few American cities, and also includes examples of diphtheria preventive measures on the continent and in parts of the world other than the United States.

The Mississippi Flood—Flood prevention and Red Cross relief on the Mississippi is discussed in *World's Health* for August, 1927, by C. W. Jackson, Relief Division of the League of Red Cross Societies.

The recent flood conditions are discussed after an introduction which outlines disasters which have occurred elsewhere. The public health organization for refugee camps included the provision of medical and nursing service, medical supplies, dispensary and emergency hospital equipment, furnished by the Red Cross wherever state and local health resources were inadequate to meet the situation. Other considerations in connection with such camps were (1) purification of water supply, (2) protection of food supplies, (3) sewage and garbage disposal, (4) prompt reporting and isolation of communicable diseases. Camp organization also required the immediate immunization of all camp residents against typhoid and smallpox.

For the flooded areas immunization against typhoid fever was required of all citizens and supplemental personnel and supplies were furnished by the Red Cross where the facilities of the local organizations were wanting.

This plan of coöperation between the Red Cross and the federal, state and local governments was outlined at a meeting with the health officers of the 7 affected states who met at Memphis in April.

By May 6, as a result of the program and its determined execution, over 95,000 people had received typhoid inoculation, 85,000 had been vaccinated against smallpox, and 120,000 had received doses of quinine.

Cardiac Program—The New York Tuberculosis and Health Association, through its Heart Committee, is endeavoring to coördinate cardiac activities in New York City. With this in view the work of the committee has been divided into 5 major activities: a service to cardiac clinics; a service to schools; a service to institutions; public health education, and research. The association is endeavoring to improve clinic standards and the service rendered by the medical and social personnel in clinics. It is also encouraging the adoption of uniform records and reports in all clinics and minimizing the overlapping of clinic activities.

County Health Units in New York State—The Milbank Memorial Fund has recently issued a pamphlet reporting the conference held in Albany on April 24, 1927, at which time the plan to develop County Health Units in New York State was discussed.

On January 1, 1927, there were 307 counties or districts in the United States which had established a health department with a whole-time health officer in charge. The first such department was established in Yakima County, Wash., in 1911. At the rate of establishment of county health units which prevailed from 1921 to 1926 it will take over a century for the rest of the rural counties in the United States to adopt such measures for the protection of health. There are 3,043 counties in the United States, of which number 2,655 are wholly or predominantly rural in character.

In 1921 the New York Legislature provided permissive legislation for the establishment of county health departments and two years later passed a law promising financial aid to any county (not containing a city of 50,000 inhabitants) which should take advantage of the permissive legislation of 1921, to the extent of 50 per cent of the expenses incurred. Cattaraugus is the only county which has organized a department under the terms of this law. It is in this county that the Milbank Memorial Fund has instituted its demonstration in rural health.

Dr. Matthias Nicoll, Jr., Commissioner of Health of the State of New York, suggests as the minimum for a county health organization the employment of a full-time health officer, 2 or 3 public health nurses, a sanitary inspector, and a clerk-stenographer. The minimum cost of such service is estimated as $14,700, and the maximum $24,000.

Governor Smith expressed his personal interest in the extension of the state's health service, and emphasized the need of transferring more responsibility to the local communities, the administrative unit of which may well be the county.

LABORATORY

C. C. YOUNG

A NEW METHOD FOR STAINING NEGRI BODIES OF RABIES

T. F. SELLERS, M.Sc., FELLOW A.P.H.A.

Director Georgia State Board of Health Laboratory, Atlanta, Ga.

THE most satisfactory methods of staining Negri bodies heretofore described are those of Van Gieson, Mann, Williams, Stimson, Mallory, Harris, Reichel and Engle, Luzzoni and Lentz.

The methods of Mallory,[1] Mann,[2] Lentz,[3] Harris[4] and Luzzoni[5] are somewhat similar in principle in that eosin is employed to stain the Negri bodies and some form of methylene blue for a counterstain. All were devised primarily for staining sections and for this purpose they are still used. Smears can likewise be stained by these methods modified somewhat in detail, the most satisfactory being that of Harris which requires not more than 5 minutes to complete and brings out the bodies very clearly.

The methods of Williams[6] and Reichel and Engle[7] are really modifications of the old Van Gieson stain. Here basic fuchsin is used for staining the Negri bodies and methylene blue as a counterstain. These stains are not so satisfactory for staining sections but are useful for smear preparations. In American laboratories, Williams stain is perhaps the most used for all methods in staining Negri bodies.

All methods for staining Negri bodies heretofore described require preliminary alcoholic fixation of the smears. The stains are applied in the form of aqueous or very weak alcoholic solutions with the exception of Williams and Lowden's Giemsa method.[8]

A staining method has been developed at the Georgia State Board of Health Laboratory which is a departure from those previously employed, in that absolute alcoholic solutions of the dyes are used. Moist smears are prepared in the usual way and while still moist are plunged into an absolute methyl alcohol solution of basic fuchsin and methylene, then quickly removed. After washing in tap water the smear is ready for examination. The stain is prepared as follows:

Basic fuchsin (saturated absolute methyl alcohol solution)	2–4 c.c.
Methylene blue (saturated absolute methyl alcohol solution)	15 c.c.
Methyl alcohol (absolute acetone free)	25 c.c.

The methylene blue and the methyl alcohol are mixed in a Coplin jar and 2 c.c. of the saturated fuchsin solution is added. A trial stain is made. Macroscopically the properly stained smear, when held up to the light, should appear reddish violet in the thinner areas shading into purplish blue in the thicker portions. If in the trial stain the thinner parts are bluish, 0.5 c.c. more fuchsin should be added and another trial made. Two c.c. fuchsin solution is nearly always sufficient. The mixed stain seems to improve after 24 hours' standing and thereafter keeps indefinitely if protected from evaporation, which tends to make the fuchsin become too dominant. The addition of absolute methyl alcohol to the evaporated stain will usually restore the proper balance to the two dyes. On the basis of the above formula the stain may be prepared in any quantity, and if kept tightly corked will maintain its quality indefinitely.

TECHNIC OF STAINING

Thin smears from the Ammon's horn hippocampus are prepared in the usual way and while still moist with tissue juice are plunged into the stain, removed immediately and rinsed under the tap. The entire process should be completed in less than 5 seconds. The stained slide may be dried by warming and waving through the air. Blotting is not recommended because the wet smear is very easily wiped from the glass.

The low power two-thirds objective should first be used in examining the stained smear. Thin areas showing numerous large nerve cells well spread out should be spotted and then examined with the oil immersion.

The Negri bodies are stained a bright cherry red and stand out in strong relief. The basophilic or blue staining masses in the bodies are nearly always clearly visible. The cytoplasm of the nerve cells stains more or less purplish blue, depending upon the balance of the fuchsin and methylene blue; the nuclei and nucleoli of the nerve cells stain more deeply blue; stroma is stained rose pink; nerve fibers stain a deeper pink; the neural sheaths do not stain; bacteria (if present) are stained intense blue; muscle fibers stain brick red; erythrocytes, copper color. In short, the differentiation of the various tissue elements is very similar to that obtained by the Van Gieson or the Williams modification. The Negri bodies, however, are stained much more sharply than by any other method yet tried by the author. The quality of the results varies somewhat with the condition of the tissue at the time the smears are prepared. Best results are obtained from the freshest tissue. As decomposition sets in the histological differentiation becomes poorer although the Negri bodies retain their staining quality even after considerable decomposition has developed. Thus it is possible to detect characteristic bodies in smears where degeneration has destroyed or blurred all other cellular elements. With a little experience one can recognize Negri bodies situated extracellularly as readily as those which are intracellular.

There is considerable variation in the staining reactions of Negri bodies in different specimens. In one brain the Negri bodies may stain sharply, the majority showing the classic reaction and internal structure. In another the bodies even of the same size seem more resistant to the stain, appearing opaque and "dead," the inner structure being determined with difficulty, or not at all. Preparations from the same brain may differ as influenced by such factors as thickness of smear, staining time, degree of moisture, etc. It is seldom, however, that with the staining method I have described any difficulty will be encountered in distinguishing typical or atypical Negri bodies from all other cellular elements, artefacts and inclusions due to other causes.

The special advantages of this method are:

1. The entire procedure requires less than one minute.
2. The stain is easily prepared and is stable. It is immediately ready for use without filtration or dilution.
3. No preliminary fixation of the smear is needed.
4. It is very useful in staining bacteria, exudates, blood, or thin smears of fresh tissue from any source. It offers promising possibilities as stain from many forms of protozoa, especially the flagellates and ciliates.

It is employed in our laboratory as a routine stain of pus smears submitted for gonococcus examination, the Gram stain being used only occasionally for confirmation in doubtful specimens.

There are certain limitations:

1. It will not stain Negri bodies in smears previously fixed in alcohol, formol, Zenkers, or any other fixative.
2. It is apparently not applicable for the staining of sections, although it may later be found of some value for this purpose if properly modified.
3. While the stain is easily prepared and operated, there are certain very important precautions to be observed:

The methyl alcohol used must be neutral and free from acetone. It should be as nearly absolute as possible, although this is not as important as a neutral reaction and freedom from acetone. [I have found Merck's Blue Label brand to be uniformly satisfactory.]

The smear must be still moist with its own tissue juice when plunged into the stain. Hence the jar of stain should be conveniently accessible. After the smear has dried the Negri bodies stain poorly and cannot easily be differentiated from other cellular elements.

The smear must be in contact with the stain only a few seconds. Even after 30 seconds the Negri bodies may appear washed out and dull.

The stain must be kept covered to prevent evaporation which disturbs the balance of the two colors. The balance may be easily restored, however, by the addition of more alcohol.

BIBLIOGRAPHY

1. Mallory. A modification described by Stimson. *U. S. Hyg. Lab. Bull.* 65, 1910, p. 65.
2. Mann. *Ztschr. Wis. Mik.*, XI:490, 1894.
3. Lentz. *Centralbl. f. Bakteriol.*, Abs. Originale Bd. 64, Heft 4.
4. Harris. *J. Infect. Dis.*, 5:566, 1908.
5. Luzzoni. *Ann. de l'Inst. Pasteur*, 37:1039, 1913.
6. Williams. *Am. J. Hyg.*, 18:1, 1908.
7. Reichel & Engle. McFarland Pathogenic Bacteria and Protozoa, 1916, p. 369.
8. Williams & Lowden. *J. Infect. Dis.*, 3:452, 1906.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Vital Statistics of Metropolitan Life Insurance Company, January–June, 1927.—The first half of 1927 has been characterized, in all probability, by better health conditions in the general populations of the United States and Canada than have obtained during the first six months of any previous year according to the records of more than 18,000,000 persons insured in the Industrial Department of the Metropolitan Life Insurance Company. The death rate for the 6 months' period, among white policyholders, was 8.6 per 1,000, as compared with 9.7 in 1926 and 8.9 in 1925. The closest approach to the 1927 figure was 8.7 per 1,000, in the first half of 1921. The death rate for colored (15.4 per 1,000) also shows a pronounced reduction over the rates recorded in the first half of 1926 and 1925. Three of the four principal epidemic diseases of childhood—measles, scarlet fever and whooping cough—show reduced death rates as compared with the first half of 1926. The 1927 diphtheria rate to date is lower than it has ever been before, at this time of the year, with the single exception of 1926, but shows a considerable increase over 1926. The unfavorable situation so far this year is probably only a temporary phase in a situation that has been marked by continuous improvement for 6 years. The typhoid fever death rate has increased appreciably this year. This, however, is due almost altogether to the outbreak in Montreal. It is extremely gratifying that conditions arising from the Mississippi flood have not as yet been reflected in an increased mortality from typhoid in the United States.

The outstanding feature of the 1927 health record to date is the further reduction in the mortality from tuberculosis. Among white Metropolitan industrial policyholders the death rate for January to June inclusive, was 80.4 per 100,000, as compared with 88.1 during the same months of 1926, a drop of 8.7 per cent. The colored rate for the first half of 1927 is 237.6 per 100,000, as compared with 240.8, 244.6, 258.9 and 319.3 during the corresponding periods of 1926, 1924, 1922 and 1920, respectively. The mortality from influenza has been lower during 1927, to date, than in any year since 1924, while that for pneumonia (all forms) is better than has ever been experienced for the January-June period save in 1921. Improvement in the death rate for influenza and the respiratory diseases, always accompanied by lower mortality from the "degenerative" conditions accounts, in part at least, for the considerably reduced death rate from cerebral hemorrhage, organic heart disease, and chronic nephritis, so far in 1927. The cancer situation, far from showing any improvement, is reflected in a very small increase among white policyholders and a larger one among the colored.

The tendency of the death rate for puerperal conditions among white policyholders has been distinctly downward during the more recent years. The current rate of 14.5 per 100,000 may be compared with 15.8 in 1926 and 17.0 in 1925. Unfortunately, colored insured women have not shared in this improvement. The diabetes death rate has registered a decline among the whites as compared with the first half of 1926, although it is still somewhat higher than in 1925.

About one-fourth of all the lives lost in all kinds of accidents among Metropolitan industrial policyholders during the first half of this year, were due to automobile fatalities. Thirty-eight per cent of the death toll from automobile accidents among Metropolitan industrial policyholders, so far this year, has involved the lives of children. In previous years it has approximated 40 per cent.—*Stat. Bull.*, Met. Life Ins. Co., 8:1–7 (July), 1927.

Increase of Diphtheria in New York State—The diphtheria death rate in New York State exclusive of New York City, increased from 4.7 for the first 6 months of 1926 to 4.9 for the same period in 1927. The case rates were respectively 69 and 79. The death rate in cities over 10,000 population showed a slight decrease, 6.7 as compared with 6.9, but as usual the rate for places under 10,000 was much lower, 3.0 for 1927.

Up to August 1 of this year 86,443 persons, 16,247 of whom were under 5 years of age, were given 3 doses of toxin-antitoxin while in the corresponding period of 1927 only 16,981 persons had been given the antitoxin. The anti-diphtheria campaign is proceeding fairly satisfactorily in smaller places but greater effort is needed in cities of more than 10,000, especially for children under 5 years of age where the mortality is the greatest. Although the total population of the smaller places is only slightly smaller than that of the places over 10,000, almost two-thirds of the total immunizations occurred in the smaller places.

Although a similar increase of diphtheria has been noted in New York City, the New York City Health Commissioner believes there is no cause for alarm or fear that the standards of health work have lowered. The disease often increases and decreases in cycles according to Commissioner Harris and the increase will probably not be permanent.—*Health News*, New York State, 4:1 (Sept. 5), 1927, and *New York Times*, Sept. 5, 1927.

The **Importance of Prenatal Care**—During 1926 in Detroit, Mich., there were 241 deaths from puerperal causes. This corresponds to a rate of 7.2 per 1,000 living births and many of these deaths could have been prevented by adequate prenatal care. Among the women who attended the city prenatal clinics there were but 7 deaths, representing a rate of 3.3 per 1,000 living births, or less than half that of the city at large.

It is interesting to note that mortality from sepsis, the most important cause of puerperal deaths, was 39 per cent less among the clinic cases than among the city at large, or 1.43 per 1,000 living births for the clinic cases and 3.66 for the whole city.—*Weekly Health Rev.*, Detroit Department of Health, Aug. 6, 1927.

A Simple Measure of Fecundity—The ratio of children under 5 years of age and women between 15 and 45 is a good measure of fecundity when it is impossible to secure birth statistics. A simpler method, however, which is applicable to different races and to the rural parts of the country where accurate age statistics are not available is the ratio between minor children and adult women. This method takes no account of the age and marital conditions of the women but since 21 is about the average age of marriage of women in the United States, the number of mothers under 21 partly balances the number of unmarried women over that age.

One advantage of the children-per-woman ratio over other statistical measures is that in many cases it closely approximates the ratio between births and deaths. In using the ratio here suggested, several possible sources of error must be borne in mind. The tendency of women, especially of marriageable age to understate their age makes the apparent ratio of children to women a little larger than it really is. The percentage of error from this source, however, seems to be about the same everywhere, and, consequently, it does not materially affect the value of the figures for comparing different times and places. Another source of error which may be serious for some counties or cities but not for whole states, is the counting in the regular population of the inmates of educational, military, charitable and penal institutions.

The number of children per woman in this country in the middle of the 18th century seems to have been about 4, and 3 in 1820. In 1900, which seems to be as far back as this method can be carried safely for natives and foreigners, native white women averaged about 1.6 minor children and foreign whites about 2.3. By 1920 these ratios decreased to about 1.4 and 1.8. The 3 southern divisions have long been the most prolific, while New England, until recently surpassed by the Pacific, Rocky Mountain, East and West North Central States, was at the other extreme. Although every section of the country has more children per woman in the rural than in the urban population there is not necessarily greater fecundity in the country nor greater longevity in the city, for the constant country to city migration alters the ratio. It is a curious fact that communities which have a high white birth rate generally also have a high negro birth rate unless the disparity of numbers of the two races is too great.—Roland M. Harper, *J. Hered.*, 18:217–223 (May), 1927.

The Ratio of the Sexes—The ratio of male to female births in the United States in recent years has been 106, according to calculations based upon the records of the United States Census Bureau for 1917 to 1924. This figure, however, varies, with the age of the mother, from 1.229 for very young mothers under 15 years of age, to 1.060 for mothers between 15 and 34, and 1.055 for those between 35 and 54, with a general average of 1.059 for all ages.

In the white population of all ages in the

United States, this ratio is lowered to 1.040 by the heavier death rates among males but, because of the excess of male over female immigration, it is still higher than that of most countries. A stationary American population, in which immigration is eliminated and the birth and death rate balanced, would have a ratio of 1.013. In European countries the sex ratios are almost all below a hundred, ranging from 93.5 for Great Britain to 99.0 for Italy, and 104.5 and 106.0 for Bulgaria and Serbia, the only European countries, according to A. S. Parks in the *Eugenics Review* (Vol. 17, page 285), with ratios above one hundred. These figures are largely the result of the heavy migration and higher mortality of males. The ratios of Asiatic countries are very heavily in favor of males, in China, for example, the ratio is 125 males for 100 females. This figure is probably somewhat inaccurate due to the tendency of eastern nations to regard the female lightly which probably results in many escaping enumeration. Nevertheless, in spite of woman's naturally greater resistance to ordinary life hazards, the survival of women in these countries is less than that of men.—*Stat. Bull.*, Met. Life Ins. Co., 8:7–9 (July), 1927.

The Health of London in 1926—The Registrar-General estimates the 1926 midyear population at 4,605,400 civilians and 10,000 noncivilians. This estimate allows for an increase of 91,400 since the census, and as the excess of births over deaths during these five years was 165,500, emigrants must have exceeded immigrants by about 74,000 persons. The births in the county numbered 78,825, making a birth rate of 17.1. The death rate from all causes was 11.6; from tuberculosis, 1.03; from cancer, 1.46; and from pneumonia, bronchitis, and influenza combined, 1.9. The infant mortality rate was 64, and the rate from diarrhea and enteritis under 2 years per 1,000 births was 12.0.

Two small outbreaks of smallpox, comprising 5 and 2 cases, respectively, affected London, and in both the infection was derived from Paris. The case mortality of diphtheria has decreased greatly since the introduction of antitoxin in 1894. Thus the percentage figures for the eight 4-year periods beginning with 1895–98 has been 17.8, 12.2, 9.2, 8.7, 7.0, 7.4, 7.4, ending with 4.7 for the period 1923–26. A comparison of the various districts shows that the diphtheria death rate is much higher below 2 years of age in the poorer boroughs, whereas in the more well-to-do boroughs a slightly higher mortality is found between the ages of 5 to 15.

There were 173 confirmed notifications of encephalitis lethargica with 68 deaths. During the years 1919 to 1925 there were 1,325 true cases notified with a 37 per cent mortality. When allowance is made for the change in the age constitution of the population between 1911 and 1921 it is found that the female deaths from cancer have actually decreased in number, while the male deaths have shown only a slight increase during that period. There were 90 deaths among the 337 notified cases of puerperal fever. In addition, the Registrar-General recorded 30 deaths from puerperal sepsis which were not notified. This gives a death rate per 1,000 births of 1.5.—*Lancet*, 2:36–37 (July 2), 1927.

After-Histories of Sanatorium Cases—The public health committee of the London County Council in order to assess the value of residental treatment for tuberculosis, made a study of the histories of the patients during the 5 years after their discharge. Thirty-one hundred and seventy-eight of 4,094 adults discharged in 1921 were investigated. The patients were divided into surgical, sputum negative and sputum positive cases and the different classes studied separately.

The records show that 83.5 per cent of the sputum negative and 73.5 per cent of the surgical cases were living 5 years after discharge. Only 61.5 per cent of the early cases of tuberculosis, 34 per cent of the moderately advanced cases and 3.7 per cent of the far advanced cases were living in 1926.

The value of sanatorium treatment in early stages of the disease is shown by the fact that 68 per cent of the survivors of the sputum negative cases and the early cases of tuberculosis and 71 per cent of the surgical case survivors were at work. Of the survivors in the moderately advanced and the far advanced cases only 40 and 25 per cent respectively were able to work. Fifty-seven and five-tenths per cent of the total 1,230 survivors in all categories were at work, 4.4 per cent were fit for work but were unemployed and 37.5 (including cases receiving further treatment) were unable to work. The condition of the remaining 0.6 per cent was unknown. *Med. Off.*, 38:61 (Aug. 6), 1927.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

Advances in Sewage Purification — The treatment of the subject is divided into: (1) processes for removal of sludge from the sewage and sludge handling; (2) processes for purification of the liquid sewage; and (3) miscellaneous topics such as industrial wastes, house disposal systems, costs, bibliography and index.

The first section of the book dealing with sludge separation and disposal discusses: (a) new sewage screens in America; (b) new Emscher (Imhoff) tank installations; (c) two-story settling tanks or completely separate sludge digestion tanks; (d) flowing through digestion tanks; (e) trickling basins and partial dewatering; (f) ponding on land; (g) stream clarification applications; (h) storm water tanks; (i) recovery of gas from digestion tanks; (j) sludge lagoons, and (k) agricultural value of sludge.

Discussions of topics (a) and (b) are largely concerned with American practice. About 600 American cities and communities have installed Imhoff tanks for sewage treatment. Under (c) the advantages and disadvantages of the two methods of sludge digestion are compared and their relative importance considered. Heat losses in the separate method result in unfavorable digestion progress but may be overcome if the sludge chamber of the Emscher tank is divided into two parts, one of which is below the sedimentation chamber and the other or digestion compartment is adjacent to it.

Sickerbecken (trickling basins) are described as shallow basins with a layer of underdrained filtering material through which the liquid sewage is withdrawn after deposition of sludge has taken place by plain sedimentation of the slowly flowing through sewage. Such basins are constructed in groups so that some are in use while others are being drained and sludge is drying and being removed. Their design and operating features are described in some detail.

Ponding (f), and stream clarification processes (g) are methods employed in special cases for providing plain sedimentation and deposition of sludge by the formation of pools on land or in stream channels respectively, and are of limited application. Storm water tanks (h), provide sedimentation for flows in excess of the general volume of sewage flow of combined sewers and where complete treatment is not necessary.

Methods of gas recovery from digesting sludge, (i), are discussed. The average amount of gas obtained from Emscher tanks is 8 L. per day or 3 cu.m. per year per person contributing sewage. The gas is composed of: methane, 80–85 per cent; carbonic acid, 7–20 per cent; nitrogen, 0–8 per cent; and hydrogen, 0 per cent.

The use of the sludge lagoons (j), in America and Germany is briefly touched upon and the disadvantages of the method clearly stated. Digested sludge is recommended for agricultural purposes (k), for reasons given. The use of raw sludge has numerous disadvantages which are enumerated.—Dr. K. Imhoff, *Fortschritte der Abwasserreinigung* (2d ed.), 1926. Published by Carl Heymanns, Berlin, Germany. Pp. 1–56. Abstr. J. K. Hoskins.

Progress in Sewage Treatment—Dr. Imhoff presents concisely in this section of his book a general discussion of international developments and recent practice (until June, 1926) with trickling filters, activated sludge process, intermittent sand filters, fish ponds and chemical purification.

The 1926 supplement to the chapter on trickling (biological) filters mentions Stroganoff's work on artificial aeration at Moscow. His aero-filter is arousing renewed interest in a method similar to that attempted by Hering in 1909 at Atlanta. The use of chlorine for odor and fly prevention is also discussed.

The chapter on activated sludge deals principally with the process. It is divided under the headings of pretreatment, aeration basins, final settling, and sludge. A short section on power consumption and costs which are comparative is also included. Developments in the Ruhr district with the process, mechanisms in use, and gas produced by sludge are covered in the 1926 supplement to this chapter.—Dr. K.

Imhoff, *Fortschritte der Abwasserreinigung* (2d ed.), 1926, pp. 57–102. Abstr. R. T. Regester.

Progress in Sewage Disposal—*Industrial Wastes.* In the treatment of industrial wastes not much progress has been made, and many of the difficulties encountered in treating such wastes are still being overcome by mixing the wastes with domestic sewage.

The common methods of removing sludge from tanks are described, including mechanical devices such as the Fidler sludge remover, the Dorr thickener, and a suction dredge manufactured by a German firm, which is used for the same purpose. For disposing of sludge, the methods of placing it on porous beds and that of lagooning are referred to.

Industrial wastes containing organic matter can usually be handled the same as domestic sewage, particularly wastes from the foodstuff industries. In this connection, as well as in the treatment of phenol wastes, the activated sludge process is stated as coming more and more into use.

According to the author, in the treatment of industrial wastes there is an increasing endeavor to make use of the effluent from the treatment plant, in the industry, and oftentimes in such cases, the expensive treatment plant proves economical in the end.

Home Sewage Disposal. The question of home sewage disposal, which was thought at one time to have been settled, became important again during the war, but to-day it is again realized that all houses should be connected to a public sewerage system when at all possible. A brief outline of the American practice in this respect is given. In Germany, pit privies are permitted provided that the house is so located with respect to the privy, that the drainage is away from the house. Small tanks of the Imhoff type are used for some houses when the house is connected to a water supply. The particular undesirable feature of this tank has been found to be its small size, which is considered the main reason for its neglect. There are a large number of medium and small sized towns in Germany which have both public sewerage systems and many individual appurtenances, the latter consisting mainly of pits with illegal overflows into the city streets. In one case it was found that the sewage from a pit was pumped regularly each night into the street. In another case it was pumped into the street just before an expected rain. For these reasons it is believed that the individual plants have not contributed to the reduction of pollution of streams, but that more pollution is received into the stream in this way than if a public sewerage system is used throughout, with the simplest kind of treatment. In Leipzig and other large cities, in spite of the fact that a free sewerage system is available, there is still much collection and disposal of sewage on the premises, a common practice of removal being by trucks, about once a year.

It is suggested by the author that instead of enforcing the law prohibiting the discharge of sewage into the streets all owners of houses be forced to connect the house to the public sewerage system wherever possible.

Design and Costs of Disposal Plants. From the standpoint of the comfort of the residents in the vicinity of the disposal plant, it is desirable that there be no odor. Both in the United States and Germany, a treatment plant is now demanded which does not give off offensive odors. For this reason, the septic tank, except for small installations, is coming into disuse.

From a health standpoint, the effectiveness of a treatment plant can be measured by the extent to which the danger of disease transmission is reduced. The content of putrescible organic matter is mentioned as being the most important factor for consideration, and the ordinary methods for preliminary and final treatment are briefly outlined.

A per capita comparison of initial costs, operating costs, etc., of a number of treatment processes is made by listing 6 comparable processes in a table. Such processes where the costs are dependent in large measure on local conditions, are not mentioned, as are also not those which are considered out of date or not used in Germany on account of their high cost. —Dr. K. Imhoff, *Fortschritte der Abwasserreinigung* (2d ed.), 1926. Published by Carl Heymanns, Berlin Germany. Pp. 106–116. Abstr. A. L. Dopmeyer.

Camps—The State Board of Health issued an order during the year requiring a permit for each summer camp. An engineer was assigned to work with deputy state health officers in investigating sanitary conditions of camps. There were 109 inspections during the year. As a result of this work the following practice is recommended: (1) the insertion of

a notice in the daily papers in February and March to the effect that any camp, summer hotel, summer boarding house, picnic grounds, etc., may not operate during 1927 without a permit; (2) inspections and sampling during spring and summer; (3) establishment of reasonable limit of time for improvements; (4) follow-up inspections with refusal or granting of permit as conditions would warrant; (5) placarding the state road camps stating that the place has been investigated by the State Department of Health and approved. If studies showed them unsatisfactory the proper authorities should be requested to improve them before receiving the Health Departments approval.—*Report of Bur. of San. Eng.*, Maryland State Dept. of Health, 1926, 19 pp. Abstr. I. W. Mendelsohn.

Multiplication of B. Coli in Stored Shellfish—This article is concerned with an experiment conducted by the New Jersey State Department of Health with respect to the tendency of bacteria of the *B. coli* group to multiply in shell stock after removal from the natural waters, provided that the shellfish are kept alive and in a thriving condition. The report of the Committee on Sanitary Control of the Shellfish Industry of the United States has stated that from the evidence available the bacteria of the *B. coli* group do not tend to multiply in shell stock after removal from the water so long as the shellfish are kept alive and in a thriving condition, whereas in the instance of an experiment by Calista Eliot, entitled, "Observations on the Colon-Aerogenes Group from the Oysters," published in the *American Journal of Hygiene*, November, 1926, it is reported that the *B. coli* group in stored shellfish increased from 4 to 500,000 in 14 days, no statement being made as to the age of the oysters at the beginning of the experiment. Four hundred oysters were accordingly collected by the New Jersey State Department of Health from a New Jersey shellfish area and kept at a temperature of from 21° to 24° C. for a period of from 1 to 8 days, four samples from the oysters being examined each day by the regular standard methods.

The result of this test by the New Jersey State Health Department showed "an appreciable increase in scores and total count of stored oysters and generally confirmed the findings of Eliot. As the purpose of the bacteriological scoring of market oysters is to obtain an idea of the probable degree of pollution of the waters in which the oysters are grown, it is apparent that such examinations, unless carried out upon fresh stock, are misleading."

It is the intention of the New Jersey State Department of Health to incorporate in the rules and regulations governing the handling of shellfish in that state a section requiring all retail dealers of shellfish to stamp upon all shipping tags the date of receipt of shipments. —John E. Bacon, *Pub. Health News*, N. J. State Dept. of Health, 12:87 (Feb.–Mar.), 1927. Abstr. E. C. Sullivan.

Stream Pollution in the United States—This "monograph relating to the pollution and obstruction of navigable streams in the United States by sewage and industrial wastes" is a well written, running review of many publications on the subject, describing the increasing burden of stream pollution and the various methods of sewage and industrial waste treatment that give promise of relief. The scope of the paper is best gauged by the section headings of the table of contents:

The menace of stream pollution
The extent of stream pollution
The composition of sewage
The decomposition of sewage
The problem of sewage disposal
Industrial wastes
Tomato-canning wastes
Acid-iron wastes
Strawboard-industry wastes
Sulphite pulp waste
Distillery wastes
Oil pollution
Sewage treatment
The utilization of sewage
The recovery and utilization of industrial wastes
Recovery and utilization of sulphite wastes
Recovery and utilization of tannery wastes
Recovery and utilization of coke-oven wastes
Recovery and utilization of strawboard wastes
Recovery and utilization of metal industries wastes
Conclusion

The references are clearly stated for many of the positive statements made in the text. An index adds to the value of the paper. Prepared by Geo. J. Schulz, *Legislative Reference Service, Library of Congress. House of Representatives Document No. 632, 69th Congress, 2d Session.* 31 pp. Abstr. J. K. Hoskins.

Responsibility of Interstate Carriers in Supplying Safe Drinking Water to Passengers and Crew—Outbreaks of typhoid fever and other water-borne diseases due to impure drinking water on vessels operating in United States waters are cited. The responsibility of companies transporting passengers in interstate traffic for the safety and welfare of the passengers and crew is clearly defined under the common law interpretation. The Interstate Quarantine Regulations set a standard and prescribe a penalty for violations.

Two cases are shown to have been brought by persons claiming damages from sickness from typhoid contracted due to impure drinking water furnished while on ship. In one case "the court held that 'an award of $1,500 as actual compensation for pain and suffering is probably no more than would be given by either court or jury in a normal and individual case' and made this award to nine of the libelants. In addition, the court awarded damages for medical expenses, business losses, costs, etc., the total sum involved for all the libelants being over $38,000.00."

In the other case the vessel was libeled and the court ordered its sale. "In the meantime, negotiations progressed, and the libelants' counsel finally offered to accept $110,000 in full settlement. The case was disposed of on this basis and the steamer was sold."—I. W. Mendelsohn, *Pub. Health Rep.*, 42:868 (Apr. 1), 1927. Abstr. G. H. Hazlehurst.

"Water Dogs" in a City Water Supply—For several years the water consumers of an Alabama city of 40,000 population have been finding "water dogs" in the water, later identified as the tiger salamander. The occurrence of these findings was not confined to any definite season. However, they were more prevalent in the spring. The question of "water without dogs" gained such strength that it became a political issue.

The city water supply is obtained from a large spring, from which the water is lifted to an open reservoir which supplies the city by gravity. The spring is housed over.

Investigation proved that the adult salamanders, which are from 8 to 12 inches in length, were using the reservoir as a breeding place. Here they laid their eggs and the tadpoles, after hatching, lived until the following year, at which time they lost their gills and became land animals, only returning to the water to lay their eggs.

In the spring of 1926 the reservoir was thoroughly disinfected and a 56-inch fence, with the bottom 30 inches made of ¼-inch mesh, was placed around it. No further complaints have been reported after one year's service.—R. A. Polglaze, *Pub. Works*, 58:97 (Mar.), 1927. Abstr. R. J. Faust.

Chemical Treatment of Trade Waste. Part I. Dye Waste in General—The literature pertaining to the disposal of dye wastes is briefly reviewed. "Problems relating to purification of dye works waste may be sharply divided into those in which all of the waste must be treated and those in which a limited amount of waste may be discharged through community sewers. . . . The latter case is much simpler and cheaper, because the worst of the discharge may be 'scalped' and the clearest part treated by chemical means."

In the order of their importance, the four practical methods of purifying dye wastes are coagulation, oxidation or reduction, decolorization by carbon, and evaporation. "A waste would be treated by the latter two methods only under the most extreme conditions." Copperas is the cheapest coagulant available in the average case.

"Barbour (*Eng. News*, 62:99, 1909) has proposed a standard of not over 300 p.p.m. of total solids, 200 p.p.m. fat, no abnormal acidity or alkalinity, and removal of pronounced antiseptic properties. In many cases this standard of total solids works an undue hardship. The others are general practice. . . . While there is nothing in the color of waste necessarily harmful, it is usually the principal point considered by non-technical people. . . . The purity of the water may be lessened by commercial use provided no actual damage is shown."

"In general, determination of total solids and loss of ignition gives a rough estimate of the degree of contamination. . . . A quicker and simpler method for routine testing . . . is oxygen consumed by the permanganate method. The biochemical oxygen demand is more indicative of the real contamination by organic matter, but is so difficult of manipulation and uncertain as to results as to fail to justify the expenditure of time. . . . A suitable method of measuring colors before and after treatment is by use of a Lovibond tintometer, using a cell thickness of 50.8 mm. (2 inches)."—Foster D. Snell, *Am. Dyestuff Reporter*, 16:54 (Jan. 24), 1927. Abstr. E. J. Theriault.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., AND LEONARD GREENBURG, PH.D.

The Decline in Lead Poisoning—The author regrets the steps which have been taken in a few states and countries to prohibit the use of lead compounds in painting, resulting in serious economic questions. Trustworthy evidence has proved the needlessness of prohibition, while fully supporting the urgency of rational regulations. A decline in the death rate from chronic lead poisoning is noted in the United States in the drop from 2.5 per million in 1910 to 1.4 in 1924. Even greater declines are noted in insurance experience, in the U. S. Navy, in the City of New York and elsewhere. Many cases in the Census records have been due to lead contaminated water, particularly in rural districts.

Among painters the decline has not been so marked, as it appears. There were 407 deaths during the five years ending 1913, against 360 deaths during the five years ending with 1923. There was an increase in the average age of death among painters from 50.6 years to 51.9 years. In New York State the electric storage batteries industry has been the leading occupation most subject to lead poisoning. Of 920 cases reported, 461, or 50.1 per cent, occurred in this industry, while 270, or 23.9 per cent, occurred in painters. The author doubts whether there is any true seasonal incidence, although the largest proportion of cases was reported in November and December in New York State.

Lead poisoning in the printing trades has very materially diminished in recent years. In 1,592 deaths from chronic lead poisoning among all occupations in the registration area, only 67 were printers. In 1925, out of 142 deaths in the area, only 5 were printing employes.

The rising standard of life among all wage earners, yielding better nutrition, less exhaustion or fatigue, and a decidedly higher degree of physical existence has been of the greatest importance in reducing lead poisoning. Likewise have been the lack of gross intoxications, better plant condition, etc., brought about by rational factory legislation "and not by drastic prohibition." A rather high incidence of lead poisoning is noted for Utah mines. The author's investigations do not support the conclusions implied by others that the risk of lead poisoning to women in American industries at the present time is a serious one. Of the 1,592 deaths above stated for the registration area, only 48 were of women, at the average age of 51.8 years, and practically all of these were houseworkers or farmer wives, oftentimes the death certificate recording drinking water conveyed through lead pipes as causal, while a few were from the use of cosmetics, and some were from industrial processes. "Nor am I inclined to give much weight to the alleged higher susceptibility of women to lead poisoning." In potteries, lead poisoning is now largely a thing of the past; the credit for the improvement belongs jointly to the employers, the workers, and the state. During 1925, out of 142 deaths, not a single one occurred in a pottery worker.

"The outstanding result of the present investigation is the concentration of fatal cases of chronic lead poisoning in the painting trades, on the one hand, and of non-fatal cases in the manufacture of electric storage batteries on the other hand." Assuming that there are 50 cases to 1 death, there would be something over 7,000 cases of lead poisoning per annum in the United States. "The form of lead poisoning as it occurs among painters is of a decidedly more chronic and serious type than the lead poisoning that occurs among storage battery workers."

The author recognizes the importance of the researches conducted by Aub and his coworkers upon lead poisoning at Harvard University; also the report made by the Royal Commission on Plumbism, South Australia. The author feels that there is a great confusion in the reporting of cases as "lead poisoning" which should be merely "lead absorption." He discusses this apparent confusion at considerable length, noting also that where compensation for lead poisoning is not granted in the United States, the number of reported cases is exceedingly small, while in states with very liberal compensation laws the number of cases assumes formidable proportions. Therefore,

there is an urgent need of developing more trustworthy methods of diagnosis. The work of Dr. Kehoe and of others on the excreting of lead in normal persons shows that lead absorption is exceedingly common, and "it is my deliberate judgment that many (of such) cases (reported) are not lead poisoning in the accepted sense of the term, though unquestionably cases suggestive of lead-absorption." There are many serious questions still open in the field which can only be solved by continuous and strictly impartial or disinterested scientific research.

[*Abstractor's comment*—The fact that more cases of lead poisoning are reported in states where compensation is given is exactly similar to the situation regarding the number of cases of accidents which are reported. In Ohio, our factory inspections and investigations disclosed that many cases of lead poisoning, particularly in storage battery establishments, were diagnosed as "lead absorption," plainly in order to circumvent the law requiring the reporting of all cases of "lead poisoning." The object, plainly, was to keep down the relatively enormous numbers of cases of true lead poisoning. To the abstractor, it is difficult to see why there should be any confusion between cases of "lead absorption" and cases of "lead poisoning," since there are no symptoms of intoxication where "lead absorption" alone exists, whereas the addition of symptoms of intoxication added to the evidences of "lead absorption" are necessary in order to make a diagnosis of "lead poisoning."—E. R. H.]—Frederick L. Hoffman, Prudential Insurance Company. Address before the Royal Institute of Public Health, Ghent, Belgium, June 1–6, 1927, *Prudential Press*, Newark, N. J.

Occupational Disease Claims in Ohio—"The law providing for the payment of compensation for disability resulting from occupational disease was enacted in 1921. Since July 1 of that year, the date on which the law became effective, up to January 1, 1927, a total of 4,443 claims have been filed. These claims have been classified as shown in accompanying tables."

In looking over the totals it is found that skin diseases are responsible for the largest number of claims in any individual group. In this classification 3,005 claims were filed because of some skin disease resulting from the employe's occupation. Dermatitis or inflammation of the skin is given as the cause of disability in 2,890 claims. These cases of dermatitis were due to the action of various industrial elements or compounds upon the skin and among these are listed oils, cutting compounds, gases, dust, liquids, fumes or vapors. A few cases were attributed to the action of benzine, gasoline and similar compounds. Many of the cases in this group have been mild or of short duration for the table shows that only 1,233 produced a disability lasting more than seven days. In 1,240 cases there was no time lost by the employes. The total group of skin diseases was responsible for a loss of 86,253 days. This includes five fatalities and two permanent disability claims. The 1,233 cases which produced a disability of more than seven days resulted in a total loss of time of 47,489 days or an average of 38 days per case.

The second important group is found in the class of industrial poisons. This includes poisoning by brass or zinc, lead, mercury, phosphorus, arsenic, benzol, analin, etc. Of this group of poisons lead is responsible for the largest number of claims and for the greatest period of disability in total days lost of any single disease in the entire list of occupational diseases. Out of a total of 907 claims filed for lead poisoning, 759 show a disability of more than seven days and 37 are reported as fatal. Only 65 show no time lost. This indicates that more than 75 per cent of the cases of lead poisoning reported resulted in a disability of more than seven days. Including fatal and permanent disability claims lead poisoning has been responsible for a loss of 277,112 days. From this standpoint it should be noted that lead poisoning is the most important of the compensable occupational diseases.

The other industrial poisons in the group, while less important than lead, have been responsible for the occurrence of a number of cases of disability among the employes. Thirty-four claims were filed for benzol and its derivatives; 61 for brass and zinc; 40 for anilin and 10 for arsenic poisoning. A glance at the tables will show that claims were filed for disability resulting from other conditions but those above mentioned are considered the most important among the group classed as compensable.

It should also be noted that 336 claims were filed which could not be classified under the provisions of the present law and for this reason the payment of compensation and medical expense was denied. This group includes a number of cases which may have been thought by the employes to be compensable under the Occupational Disease Law or may have been filed as one of the compensable conditions and found after a thorough examination and investigation to be in the non-compensable group such as tuberculosis, bronchitis, nephritis, etc. The table shows that diseases of the respiratory tract, especially tuberculosis, asthma and bronchitis are the most numerous and claims were filed as follows: 75 for tuberculosis, 17 for asthma and 41 for bronchitis.

In looking at the totals it is seen that the number of compensable claims reported to date have been responsible for a loss of 760,069 days.

The fatalities alone were considered equivalent to a loss of 606,000 days. The total medical expense for the treatment of all cases is $98,966.

Of the cases of lead poisoning, 907 in number, 37 were fatal, 1 a permanent disability, 759 showed disability of over 7 days, 45 under 7 days, and 65 have no time loss. Of these cases of lead poisoning 84 occurred in connection with building erection and demolition; 112 in chemicals and allied products; 57 in clay, glass and stone products; 2 in food and beverages; 1 in leather and leather goods; 21 in lumber and wood products; 4 in blast furnaces; 29 in machinery manufacture; 356 in metal goods; 161 in vehicle manufacture; 25 in paper and printing; 15 in rubber and composition goods; 1 in textile and clothing manufacture; 8 in miscellaneous industries; 1 in transportation; 1 in utilities; 17 in commercial pursuits; 6 in care and custody of buildings and grounds; and 6 among public employes.

The total compensation paid for these 4,443 cases was $369,942, of which $178,743 was for fatalities, $2,890 for permanent disability, and $188,309 for disability lasting over 7 days. The total compensation cost for the 1,765 cases of skin diseases entitled to compensation was $82,-682. Of this sum approximately $37,500 was paid for compensation for dust as a skin irritant, $18,600 for liquids, $16,600 for handling or use of oils, $5,100 for cutting compounds or lubricants, $1,300 for exposure of the skin to fumes, and $400 for exposure of the skin to gases and vapors.

Of the total of $280,070 paid for 997 claims for industrial poisoning, $241,760 was expended for 842 cases of lead poisoning, and $17,773 for 33 cases of poisoning by benzol or its derivatives, not including anilin, of which there were 31 compensable cases with claims totaling $8,446.

The medical cost of occupational disease claims which were awarded from July 1, 1924, to January 1, 1927, totaled $98,866, of which approximately $46,400 went for lead poisoning, $45,285 for skin diseases, and $2,700 for the treatment of poisoning by benzol and its derivatives.

There were in addition a total of 336 claims filed for occupational disease disallowed because they did not come under the occupational disease law (which comprises a schedule of 15 afflictions only). Of these, 75 were claims for tuberculosis through the various industrial causes, 17 for asthma, 41 for bronchitis, 16 for poisoning, 40 for infectious and contagious diseases (alleged as incurred through industrial exposure), 86 inflammatory afflictions, 16 neuritis, 17 circulatory, 6 arthritis, while 21 cases were without a statute coverage for one cause or another.

The bulletin in question gives complete tables for the 4,443 occupational disease claims filed, with a distribution in the different industries, severity by days lost, or fatality, compensation cost by industries, and medical cost by industries; likewise for the 336 claims not allowed or recognized as coming under the law.—*Special Bulletin No. 1*, Div. of Safety and Hygiene, Industrial Commission of Ohio, Columbus, 1927.

Silicosis and Tuberculosis as Seen in the Granite Workers in Barre, Vt.—While this paper presents a brief description of earlier studies on silicosis and the etiology of the disease it is for the most part a presentation of the clinical material of silicosis both of the simple type and the type complicated by tuberculosis. The author presents case histories and radiographs of many interesting cases of simple and complicated silicosis and points out some of the more important diagnostic signs to be looked for. From data which he presents it is apparent, at least according to his experience, that silicosis complicated with tuberculosis is an advent of longer occupational histroy than is simple silicosis. Of course silicosis is not a communicable disease, the overlying tuberculosis may or may not however be communicable. Examination of the histories of the families of granite cutters reveals the fact that tuberculosis among their families is less frequent than among the general population outside of the granite cutting industry, although the author does point out that there appears to be an undue prevalence of tuberculous meningitis in families where there are small children.—William McFarland, *J. Indust. Hyg.*, 9, 8:315 (Aug.), 1927.

An Investigation of Certain Health Aspects in Persons Engaged in the Woodworking Industries—This study consists chiefly of the medical examination of 208 persons employed in woodworking industries in Melbourne, Australia. It was found that 13 per cent of the workers had abnormalities of the nose and throat which was antecedent to their occupation. Slight degrees of nasal irritation were found in 19 per cent of the workers. Persons engaged on machinery fitted with efficient exhaust systems showed less nasal disorders than

others working where no exhaust was in use. Thirty-four per cent of the 113 persons whose aural condition was studied were found to be suffering from abnormalities. Asthma and bronchitis were not found to be important as occupational diseases in the groups examined and only one person of the 208 examined was found to be suffering from an occupational dermatitis caused by wood. The causative agent in this case was blackwood.—D. G. Robertson, *Service Publication No. 4* (Division of Hygiene), Commonwealth of Australia, Melbourne, 1927.

Metal Fume Fever IV. Threshold Doses of Zinc Oxide, Preventive Measures, and Clinical Effects of Repeated Exposures—The object of this paper was to determine the concentrations of zinc oxide fume which would produce fever and to study the conditions under which this fever was produced.

The zinc oxide fume was generated by melting zinc of a very pure grade, oxidizing it with a stream of oxygen and forcing the fumes into an airtight gas chamber. Obviously as soon as this dust was set up in the chamber it began to settle and for this reason the authors determined settling curves by means of the Tyndall meter and the electric precipitator. At stated times during the first four hours of the existence of the zinc oxide suspension, it was respired by subjects each provided with a face mask the inlet side of which was connected with the gas chamber. The exhaust air from this face mask was passed through an electric precipitator and in this manner it was possible to calculate the amount of fume actually inspired by the subject.

The authors present protocols of the 27 experimental inhalations showing all of the pertinent data. There appear to be three variable factors which affect the extent of the febrile reaction, namely, the concentration of the zinc oxide fume, the duration of the exposure and the depth and rate of respiration. The authors have estimated the threshold values of zinc oxide in terms of these three variables and present a curve showing their results on this basis. As a result of these quantitative studies the threshold limit of 15 mg. of zinc is considered by the authors to be a satisfactory one. It has been found that men exposed for 8 hours to concentrations of this magnitude do not ordinarily acquire fever.

Preventive measures are discussed as well as factors of acquired resistance and the use of respirators in industry.—Philip Drinker, Robert M. Thomson, and Jane L. Finn, *J. Indust. Hyg.*, 9, 8:331 (Aug.), 1927.

The Storage Battery Industry—In this paper Dr. Hamilton describes the manufacture of storage batteries as conducted in American, English and German factories, and describes the precautions used for the prevention of lead poisoning. Those interested in the prevention of lead poisoning in the storage battery industry would do well to read this paper. The material, however, is not of a nature which may be readily abstracted since it is in very condensed form as presented.—Alice Hamilton, *J. Indust. Hyg.*, 9, 8:346 (Aug.), 1927.

FOOD AND DRUGS

WALTER S. FRISBIE

The Persistence of Botulinum Toxin in Discarded Canned Foods—The work here reported was undertaken to determine the persistence of toxin not as would be found under laboratory conditions but approximating as closely as possible the conditions surrounding the disposal of canned foods discarded by the housewife. Both strains of A and B botulinus were used—type A from a culture originally obtained from the olives responsible for the Greensburg, Pa., outbreak in 1921. Atoxic spores were obtained from these cultures which were standardized for spore content by direct count, and cans of peas, corn and salmon were injected with a constant amount. This consisted of 500,000,000 detoxified spores for number 2 cans. Materials were commercially canned, tested for sterility prior to inoculations and incubated at 37° C. for two weeks after inoculation. Five gram quantities of the different mediums were spread over the inner surface of ordinary, clean, sterilized No. 1 cans. These

cans were placed in various positions—some indoors and some out, for varying periods of time. It was found that the toxin producing botulinum withstood exposure to drying, both diffuse and direct light and to seasonal variations of temperature for a period of at least 90 days. An experiment was conducted to determine whether the toxin present was the continuation of the original toxin or newly formed as the result of *Cl. botulinum* that may have been present in the original material or subsequently induced by contamination. It is definitely demonstrated that the original toxin persisted and that the putrefaction of both vegetables and meat does not cause a disappearance of this toxin. Peas, corn and salmon highly contaminated with putrefactive organisms and exposed in a moist condition yielded toxin of botulinus after an interval of 122 days.—William A. Starin, *J. Infect. Dis.*, 40:579 (May), 1927.

Botulism in the Union of Socialist Soviet Republics—Up to the present, 12 botulism outbreaks have been recorded in the Soviet Republic. There were 52 cases of poisoning and 35 deaths, making a death rate of 67.3 per cent. In Russia botulism is caused chiefly by salted, smoked or dried fish which is not boiled or roasted. The fish containing the toxin of botulism usually appeared to be a good product, without evidence of putrefaction or objectionable odor, not resembling the rotten fish which is likely to cause only gastroenteritis. Konstansov has proved experimentally that the toxin of botulism may remain in contaminated fish for a period of two years but that putrefaction and heating to 50° C. or over destroys it.—Prof. S. I. Zlatogoroff, *J. A. M. A.*, 88:2024 (June 25), 1927.

Can B. Coli Be Used as an Index of the Proper Pasteurization of Milk?—Sixteen pasteurization plants in the city of Baltimore were studied to determine the *B. coli* content of the pasteurized milk. Properly pasteurized milk is regarded as milk that has been heated to a temperature of 143° F. for 30 minutes with proper cooling to 40° F. The term *B. coli* includes all members of non-spore-forming aerobic bacilli which ferment lactose with gas formation. Tables are given showing the efficiency of pasteurization as determined by this index which show considerable variation in the different plants as regards the temperature and time of heating. It was found that the controls in plants showing improper heating or other irregularity in procedure were high in *B. coli*. A standard method of examination is presented from which it is concluded that tests for *B. coli* in pasteurized milk can be used to advantage in determining the efficiency of the plant procedure.—Jos. C. Swenarton, *J. Bact.*, 13:419 (June), 1927.

The Formation of Vitamin B from a Vitamin-Free Nutrient Solution by Means of Bac. Vulgatus (Flügge) Migula—A nutrient solution was prepared from mineral salts, synthetic malic acid and glucose made from corn starch which had been proven vitamin free. In this medium *Bac. vulgatus* was grown. Masses of dried bacterial growth in the amounts of 0.2 to 0.4 g. per day sufficed to furnish a sufficient vitamin B supply to rats to maintain growth during the 62-day experiment. It was concluded that *Bac. vulgatus* has the power to form vitamin B out of a nutrient solution known to be free from this vitamin.—Arthur Scheunert and Martin Schieblich, *Biochem. Ztschr.*; 184:58 (Apr.), 1927.

Commercial Bacillus Acidophilus and Bacillus Bulgaricus Cultures and Preparations: Bacteriologic Status—Bacteriological examinations were made of 107 samples of commercial *L. acidophilus* and *L. bulgaricus* preparations as found on the market. Of these 34 were broth and 28 milk cultures, 34 tablet, 3 powder and 8 semi-solid preparations. Examinations were made for the numbers of bacteria present and identification of the predominating organisms found. From the examinations it was found that, (1) the milk cultures showed the highest average counts, the whey cultures next to the highest and the solid cultures the lowest; (2) all samples of one type from any one producer, examined before the expiration date, were more or less similar in quality, regardless of date; (3) liquid and solid preparations marketed by the same producer were somewhat similar in quality; (4) contaminating organisms were more common in solid than in broth or milk cultures; (5) of 33 strains of organisms isolated from cultures claimed to be *L. acidophilus*, 19 showed a possibility of being that organism, and 14 did not, and of 15 organisms isolated from preparations claimed to be those of *L. bulgaricus*, 10 showed a possibility of being that organism, and 5 did not.

Of 107 samples examined, 13 produced the species claimed on the label in reasonably pure

form and in satisfactory number. Of the remaining samples, 15 were sufficiently pure and presented viable organisms in sufficient numbers to have possible value. The others were worthless as representing cultures of the species claimed.—Lawrence H. James, *J. A. M. A.*, 89:89 (July), 1927.

The Presence of Formaldehyde in Wood Smoke and in Smoked Foodstuffs—In view of the possibility that preservative properties in wood smoke are due largely to the formaldehyde introduced, a study was made of smoked foodstuffs and wood smoke to detect the presence of formaldehyde. Schryver's method which is given, was deemed to be the most satisfactory for its detection. A table is given to prove the specificity of this test for formaldehyde. Among a number of substances which may be expected to act, acrolein gives a similar color reaction. It is believed that acrolein in the quantity necessary to give the reaction, 1 to 1,000, would be unlikely in smoked food products. The results of Schryver's method were confirmed by preparing a crystalline compound, di-beta-naphthol ether of formaldehyde which melts at 190° C. Analyses of several foodstuffs from Cambridge shops are given indicating the presence of formaldehyde varying from 0.5 to 1,000 p.p.m.—Ernest Harold Callow, *Analyst*, 52:391 (July), 1927.

Composite Nature of the Water-Soluble B Vitamin—Previous investigators having expressed the opinion that the vitamin B is composed of two definite substances, experimental work with young rats was undertaken, in which yeast and wheat embryo served as sources of the B vitamins, in order to establish, if possible, these opinions. Young rats on a basal diet deprived of water-soluble B vitamin grew very slowly, with failing appetite, declining weight, and ultimately dying of inanition if given no other treatment. Symptoms of paralysis were rarely observed in these experiments. Rats on a basal diet supplemented with alcoholic extracts made from yeast or wheat embryo did not grow, but did not collapse in from 3 to 4 weeks. In from 6 to 8 weeks they died or gradually developed pellagra-like symptoms. This condition was cured slowly by the addition to the diet of a daily ration of autoclaved yeast (0.2 g. and upward). This supplement also restored growth. Some degree of growth was observed with 0.1 g. of wheat embryo and normal growth was obtained with 0.2 to 0.4 g. daily of dried yeast or 1.0 g. of wheat embryo. The demonstration of the two water-soluble B vitamins in wheat embryo is not so marked as in the case of yeast, probably owing to the fact that wheat embryo is poor in the pellagra-preventing constituent, but rich in the antineuritic factor. The absence of this factor can only be demonstrated where the animal is provided with the antineuritic factor in order to prevent collapse which otherwise would result at an early date. All known substances containing the water-soluble B vitamin, as defined by McCollum and his colleagues, contain both constituents, since both are necessary for maintenance of growth and health. Vitamin B, the pellagra preventing factor, is more thermostable than the antineuritic vitamin, the latter being freed from yeast which has been autoclaved at 120° C. for 4 to 5 hours. It is suggested that the term vitamin B should be confined to the second water-soluble vitamin (Goldberger's P-P factor), distinct from the antineuritic vitamin.—Harriette Chick and Margaret Honora Roscoe, *Biochem. J.*, 21:698, 1927.

Types of Hemolytic Streptococci in Certified Milk—Milk from about 1,000 cows from 5 different certified farms was plated about once a month for one and one-half years for the presence of hemolytic streptococci. Hemolytic streptococci of the true beta type appeared in 28.6 per cent of the samples. The number of such streptococci in the samples was usually very small, less than 1,000 per c.c. in 65 per cent and less than 10,000 per c.c. in 94 per cent of the samples.

Classification of the 394 true beta type cultures obtained placed them in 6 different species. Of these, 5 have been described before; 1 new species, *Streptococcus asalignus*, is described. All of the streptococci found in certified milk and identified, are of the bovine type with the exception of 4 cultures which proved to be *Streptococcus epidemicus Davis*. Among the bovine cultures isolated, *Streptococcus mastitidis* was the most frequently found. *Streptococcus infrequens* in about 28 per cent of the cultures was isolated and *Streptococcus subacidus* and *hemolyticus i* in but a few cases.—W. D. Frost, M. Gumm and R. C. Thomas, *J. Infect. Dis.*, 40:698-705 (June), 1927.

Mussels Placed Under Quarantine—An outbreak of poisoning resulting in at least 28 cases with 6 deaths caused the issuance by the Secretary of the California State Board of

Health on July 18, 1927, of a quarantine against all mussels in the State of California, instructing health and food officials to prohibit the sale of mussels in that state until further notice. The mussels responsible for these cases are alleged to have been gathered at Pescadero and Princeton beaches in San Mateo County, Dillon's beach in Marin County, and Sonoma County. An investigation is being conducted in coöperation with the Hooper Foundation for Medical Research to determine the exact cause of the poisoning which, so far, has not been found.

A similar outbreak was reported in July, 1927, at Santa Cruz in which two persons died after having eaten heartily of the California black mussel, *Mytilus californianus*. These mussels were gathered at low tide near Santa Cruz, were cooked and eaten and were undoubtedly fresh. A peculiar metallic taste was noted and two hours after the meal symptoms of poisoning appeared—numbness of the tongue and fingers, and lack of coördination, followed by dizziness, incoherence of speech and paralysis. Death ensued in both cases within 6 to 7 hours after ingestion of the food. Three individuals who had eaten of the mussels were only slightly affected. As a result of an investigation following this outbreak, it was found that mussels collected from high tide levels were poisonous whereas those obtained from the same locality at lower levels were found to be non-poisonous.—*Weekly Bulletin*, Calif. State Board of Health, 6:24 (July 23), 1927.

The Effect of Desiccation upon the Nutritive Properties of Egg-White—It is shown experimentally that a diet of crude egg-white, boiled and supplemented by wheat-starch, cottonseed oil, cod-liver oil, lemon juice, marmite, salts and water, will support young rats in growth and health. When the source of protein is dried egg-white, whether prepared in the laboratory or commercially, the diet is inadequate, symptoms at the end of 2 or 3 weeks becoming manifest, characterized by an eczematous dermatitis, followed by rapid loss of weight, and eventually, death. These symptoms are prevented when the dried egg-white is supplemented by carbohydrates in the form of potato-starch or arrowroot or by certain other substances in small amounts, such as dried yeast, fresh egg-white, egg-yolk, milk, commercial caseinogen, crude lactalbumin, spinach and cabbage leaves, banana, and dried horse serum. If the egg-white before drying is coagulated by boiling it is not impaired. It was found that the change occurring in dried egg-white is independent of the reaction of the solution during drying, is not due to a thermolabile enzyme and does not appear to be the result of oxidation. Crude proteins in horse serum and milk do not exhibit corresponding changes in desiccation. Two theories are postulated as to the explanation: (1) that a hitherto unrecognized dietary factor in egg-white is destroyed on drying and that this factor X is present in fresh eggs, both yolk and white, in dried yeast, raw potato, and certain other substances; (2) that a toxic product is formed when egg-white is dried which can be neutralized by the protective factor X present in certain foodstuffs. — Margaret Averil Boas, *Biochm. J.*, 21:712, 1927.

Sodium Selenate as a Cause of Poisoning—A German laborer in the glass works drank some cold coffee which had been made 24 hours previously and in the meantime kept in a flask in a cupboard. A half-hour after drinking the coffee severe symptoms in the form of vomiting, diarrhea and prostration appeared and the patient died within five hours. Since the symptoms indicated the possibility of arsenic or mercury poisoning, examination was made of the remnants of the coffee. As a result of the analysis, the coffee was found to be free of arsenic and mercury but contained a considerable amount of a selenium salt. The available literature indicated the poisonous properties of selenium and the question arose as to the source of this metal in the coffee. It developed that sodium selenate was used in the glass works and it appears probable that a fellow workman in an attempt to play a joke put the dangerous selenium in the coffee. The amount of the metal present was 1.15 g. per 100 c.c. of coffee, corresponding to 2½ g. of sodium selenate. According to references consulted by the author, the symptoms of selenium poisoning are comparable to those of arsenic; and it is a type of poisoning seldom finding its way into the statistics.—Dr. F. Riechen, *Ztschr. f. Untersuch. Lebensm.*, 4:264 (Apr.), 1927.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

Can a Change in Food Habits Change the Structure of Formed Enamel to Make It More Resistant to Caries?—That the enamel of erupted teeth cannot be changed by the most meticulous attention to diet is the conclusion of Dr. T. Leon Williams. The structural, physical and chemical qualities of the enamel are determined and fixed during the prenatal period and the first 12 years of life and consequently all attention to good food habits should be concentrated on these periods.

Lactic acid is the chief destructive agent in caries and the soft, mushy foods of combinations of sugar and starch supply the material containing forms of bacteria which produce lactic acids. Consequently, Dr. Williams says, the most important reform in food habits is to include more hard and fibrous foods, and this he considers more important than vitamins in the formation of well-developed jaws and teeth.

He further urges the administration of scientific methods of prophylaxis while waiting for such improvement of general health and improvement in teeth as the more rational food habits would give.

Despite conclusions to the contrary held by many competent observers, he maintains that no fact has been brought forward to disturb the soundness of the axiom "A perfectly clean tooth will not decay."—J. Leon Williams, D.D.S., *Dental Cosmos*, June, 1727.

Effect of Therapeutic Doses of Ultra-Violet Radiation on Basal Metabolism in Children—The authors studied 5 children in the wards of the pediatric service of the Mount Sinai Hospital from December to June to determine if there might be an immediate effect on basal metabolism following ultra-violet radiation.

The children were kept on food intake double the estimated basic caloric requirement with a protein content a little above 10 per cent. During the first part of the experiment children were kept in bed. After a week or two they became restless and were kept in bed only on the days on which they received irradiation. A Hanovian quartz mercury lamp was used. Three therapeutic treatments a week were given. Length of exposure gradually increased from 3 to 15 minutes. Basal metabolism determinations were made preceding and immediately following irradiation and again 1, 2, and 6 hours later. Blood pressure and pulse rate were taken at the same time.

The basal metabolism preceding and following irradiation usually did not vary more than 10 per cent. In all cases in which the increase was greater than 10 per cent, there was a disturbing environmental factor which, in itself, could have explained the increase.

The blood pressure and the pulse rate remained practically constant throughout.

Therapeutic doses of ultra-violet radiation did not cause any appreciable change in basal metabolism, nor any change in the blood pressure or pulse rate of these children either immediately after treatment or 1, 2, or 6 hours later. In all probability, therefore, it can be assumed that there will not be any change in basal metabolism, pulse rate or blood pressure in the majority of children following therapeutic doses of ultra-violet light.—Margaret E. Fries and Anne Topper, *Am. J. Dis. Child.*, Aug., 1927.

Cutaneous Administration of Cod Liver Oil—The value of cod liver oil in preventing and curing rickets has been heralded with extreme enthusiasm during the past few years and recent literature has been filled with reports of investigations concerning its action and its apparently close relation to the action of ultra-violet irradiation. However the interchangeability of cod liver oil and ultra-violet therapy has been overrated. Investigations have shown that the value of the oil seems to be one of control rather than prevention.

Since the importance of the skin as an independent organ of assimilation is becoming better recognized it seems logical to determine, if possible, whether or not the results commonly attributed to cod liver oil could be ob-

tained by its cutaneous administration, namely the raising of a lowered blood phosphorus concentration to its normal value.

Of 11 infants treated by applying oil saturated gauze pads to the abdomen, all but 1 showed a marked rise in the inorganic phosphorus in from 2 to 3 weeks treatment. Of 8 cases observed for calcium determination, only 2 showed an actual decline to below the normal level. Of 4 untreated control cases, 2 showed a rise in the phosphorus to approximately the normal value within 2 weeks, and 2 observed for 27 and 35 days respectively showed no improvement in this respect.

Although no conclusions should be drawn from this small series of cases various possibilities suggest themselves. The influence of cod liver oil on blood phosphorus concentration is still a matter of investigation. If this influence is actual, it would seem that cod liver oil absorbed through the skin is capable of exerting it.

Two control cases suggest the possibility that blood phosphorus tends to approach the normal even when antirachitic measures are rigidly withheld.

The relationship of these factors to clinical rickets presents still further complications.—Joseph Garland, M.D., *Am. J. Dis. Child.*, Dec., 1926.

Nutrition Class Experiments with School Children—After three years of work in Nashville, Tenn., with nutrition classes for underweight children, the question arose as to how permanent the results were. Nine classes totalling 84 children had been conducted at various times during 1923, 1924 and 1925. The children were 1 per cent or more underweight, or else were tuberculosis cases or contacts referred by the chest clinic.

Simple, practical instruction was given about food, rest, fresh air, and cleanliness. Each child had one quart of milk a day and between-meal lunches were served to part of the children.

In the summer of 1925 questionnaires were sent out to these children and, where it was possible, the children were weighed and measured again.

Only 3 of every 20 children failed to reach or exceed their expected monthly gain while in class, but 11, or 55 per cent, fell considerably below their expected gain in the succeeding months. Of these 11 only 2 continued to take milk after the class ended, while 8 of the 9 who nearly achieved their expected gain took milk.

The average gain, 1.9 lbs. per month during the class, with 93 per cent of the children making gains seems very satisfactory but the situation three months to two years later when only 45 per cent of these children were still making normal or above normal gains and only 60 per cent showed lasting improvement in health habits was not so satisfactory.

The time of instruction, five lessons in one month, may have been too short or there may have been too few conferences between teacher and nurse in planning home contacts. Some children failed to have physical defects removed, and probably the most important thing was that there was too little follow-up work. A definitely planned system of follow-up involving nutritionist, public health nurse and public health teacher, undoubtedly could have conserved much that was lost. Obviously it is unsafe to evaluate nutrition class work for short periods without a later investigation of results.—Ada M. Field and Mary A. Stennis, *Nation's Health*, June, 1927.

Coffee and Milk Drinking Habits of School Children—A survey by the Pittsburgh District Dairy Council in coöperation with Mellon Institute showed the effects of such habits in elementary and high school students.

Very complete questionnaires were sent out to schools both in the city of Pittsburgh and in the country sections near. Results of these questionnaires showed that the average city public school child drinks 1.77 glasses of milk and 0.81 cups of coffee per day; the average city parochial school child 0.93 glasses of milk and 1.52 cups of coffee.

The average country parochial school child drinks 0.89 glasses of milk and 1.37 cups of coffee. These figures apply to the first eight grades exclusive of kindergarten.

The difference in the amount of milk and coffee drunk by public school children compared with the amounts drunk by parochial school children is striking and may possibly be explained as being due to different racial dietary habits.

It was shown that the tendency to increase milk after coming to school was greater in the public schools, but that all groups of children gradually increased the drinking of coffee as they grew older.

In all four of the major groups of children

there were more pupils who had good scholarship rating than fair or poor among those who drank only milk. Among those who drank only coffee there was uniformly a large number of fair than poor or good pupils. Among children in all groups of schools there were, with the exception of those in city parochial schools more fair pupils than good or poor pupils in the cases where they were reported as drinking both milk and coffee or neither beverage.

Children from each group drank more coffee for breakfast than at other meals and the largest percentage of each group drank milk at lunch.

The survey shows that there is an apparent connection between habits of milk and coffee drinking and the quality of work done at school.

It also shows that there is need for further educational work along nutritional lines among school children and their parents. The advantages of the substitution of milk for coffee at breakfast should be stressed as well as the impropriety of the use of coffee at any time for school children. Parents who for economic reasons give their children coffee instead of milk should be taught that an adequate amount of milk is recognized by all nutrition specialists as one of the fundamentals of a balanced dietary for the young, and that they can ill afford to displace it with coffee, a beverage that has no real food value and is too stimulating for children.—John C. Fitterman, M. Lillian Conwell Shillinger and Robert Roy Irvin, *Nation's Health*, Aug., 1927.

Observations in the Underweight Clinics in Massachusetts—The Massachusetts Department of Public Health is just completing the 3rd year of its 10-year program. The plan as outlined in the beginning proposed the examination of the following groups of school children:

Children 10 per cent or more underweight for height and age

Contacts: Those known to be exposed to human tuberculosis in the homes

Specials: Those not in either of the foregoing classes but who were known to be in poor health

The primary purpose of this work was to find the children who showed some evidence of tuberculous disease. Knowing that children with the juvenile type of tuberculosis respond well to treatment it was felt that if they could be discovered and given proper care at the right time many cases of the adult type of tuberculosis would be prevented in later years. A total of about 50,000 children have been examined in the 3 years. It is proposed to continue this work for a 10-year period.

The children had a complete physical examination and were given the Pirquet tuberculin test. Later the children who reacted to the tuberculin test were roentgenographed and a report sent to the parents. The children were grouped in the following classes: those with pulmonary tuberculosis, those with hilum tuberculosis, suspects and normal children. A summary of the examinations gives the following facts:

1. There is very little difference in the incidence of hilum tuberculosis in boys and girls, taken as a whole group.
2. In the contact group there were many more girls at ages 12 to 15 who were found to have hilum tuberculosis.
3. Many more girls than boys in the contact hilum group were underweight. This was very marked in the 15 per cent underweight group.
4. In the non-contact group there was very little difference in the number of cases of hilum tuberculosis in the different weight groups.
5. Malnutrition does not appear to be a predisposing cause of tuberculosis, but when it exists it may be the result of the tuberculous infection.

From the point of public health the following facts should be kept in mind:

1. Of the children exposed to pulmonary tuberculosis 50 per cent become infected by the time they are 6 years old. One year later at 7 years they show a high percentage of hilum tuberculosis.

2. Girls 15 per cent underweight with a history of contact will show a much higher percentage of hilum tuberculosis in the age group 12 to 15.

Pulmonary tuberculosis occurs rarely in young children but may be found to the extent of 0.5 per cent in those 14 and 15 years of age.

Pulmonary tuberculosis is from two to three times as common in girls as in boys. That one-third of the pulmonary cases found in children who were not underweight, and that 20 per cent of the hilum cases found in the contact group were in normal or overweight children is conclusive evidence that all children regardless of weight should be given a thorough examination for tuberculosis.—Henry D. Chadwick, M.D., and David Zachs, M.D., *J. A. M. A.*, Aug. 27, 1927.

PUBLIC HEALTH NURSING

MIRIAM AMES, R.N.

Human Factors in the Efficiency of Public Health Nursing—So often in our efforts to provide adequate care for the sick and suffering around the corner, we lose sight of the fact that the staff nurse in our midst, the very backbone of the organization, may be carrying a mental burden, as well as a physical load, yet, "we demand from our nurses the highest standards—no matter how exacting the day's work has been, the last sick person to be cared for must have as perfect care as the first."

All of the factors should be considered when passing judgment on the efficiency, or non-efficiency of the nurse.

Working Hours—The ordinary working day is from 7 to 8 hours in length. Consideration should be given to the fact that this day is made up, not only of exacting physical exertion in caring for patients, but also of traveling from one case to another, with no small amount of wear and tear. One to two hours should be added for transportation to and from the station, as well as occasional overtime.

Salaries and Living Expenses—The staff nurse, earning a salary of $125 a month must budget it very carefully to meet her expenditure for food, rent, heat and light, clothing, personal carfare, laundry, church, charity, recreation, self-improvement, the dentist and the oculist, insurance, and incidentals. "Add up the amounts estimated for each of these items and do not put your standards too much below your own."

Sick Leave and Insurance—The efficient nurse should be free from fatigue of both mind and body. The loss of time through sickness is appalling in some Visiting Nurse Associations. "These demoralizing results are not confined to the nurse who is ill. They extend to her associates, who must add to an already full day in order that the sick may not go uncared for."

Assurance for the nurse that if she is ill her income will not cease, is one of the surest ways to get her well. Workmen's Compensation is not obligatory for philanthropic organizations, neither can they be sued for accidents to their employes. Sickness insurance is restricted where women are concerned. Group insurance is suggested as one solution of the problem, since it covers both accidents and illness, whether occupational or non-occupational. A practical plan might be worked out whereby the nurse and the association would pay part of the premium.

Vacations and Leave of Absence—The range of variation in vacation allowance to staff nurses is a debatable question. Privately financed organizations, as a rule, have a more generous policy. Mrs. Noye believes that over a long period of time more work could be done in 11 months than in 12. An additional 4-day spring vacation has proved its worth in the Buffalo Visiting Nurse Association, where from 1922 to 1926 the number of weeks of illness in a year has dropped from 53 to 22. The cash value of this plan amounts to a saving of more than $1,000 a year. Sabbatical leaves are spoken of increasingly often. The idea of 3 months with pay after 6 or 7 years of service is attractive.

Attendance at Conventions—Certainly conventions can be of the greatest value to the nurse who can organize her time, and by selective avoidance, search out the meetings that will mean the most to her and her associates. Mrs. Noye advises that the nurses be sent to conventions, not as individuals, but as delegates, and that they be given previous instruction in planning their time to the best advantage, not losing sight of the broadening influence of the contacts which they will make.

Mrs. Noye's concluding advice for a full and efficient life is to provide the nurses with opportunity and energy: "To take an intelligent interest in community and national life. To increase their knowledge of their own and kindred professions by contacts outside their daily routine. To go about work with poise and confidence, realizing that they are building for themselves, as well as for the organization. To look forward with serenity to a comfortable old age."—Human Factors in the Efficiency of Public Health Nursing Service, Mrs. Richard Noye, *Pub. Health Nurse*, June, 1927.

Worth of Knowledge—Alonzo Cano, the noted sculptor, caused no little consternation when he charged a wealthy patron $25,000 for a piece of work which he, Cano, had completed in 25 days.

Cano's reply to the remonstration is classic: "I charge you $25,000 for 25 days' labor, not because of the labor, but because of the 25 years it took me to learn how to do that work in 25 days."

That statement set forth all the theories and practices of men or women in any profession. It is not the work—we do not pretend to be day laborers—it is the benefit of education and experience which the patient receives from a well-trained doctor and nurse which makes the "labor" worth more than the "time" involved. —F. G. Toomey, M.D., *The Cactus* (Student publication), San Diego Hospital School of Nursing.

Health Hunting in an American Spa—When the words "infantile paralysis" are spoken, everyone is all attention, and new cures and effective treatments cannot fail to attract an eager audience.

"Health Hunting at an American Spa," by Helena T. Mahoney, R.N., in the *Public Health Nurse*, May, 1927, describes briefly an experiment carried on at Warm Springs, Ga., in 1926. Twenty-five infantile paralysis cases, ages ranging from 3½ to 46 years, were given muscle training exercises and taught to swim in a pool fed from a natural spring. The water in this spring is different from that of most springs as it is always 88°, is richer in mineral content, and has radioactivity. It was found that most cases could learn to swim and participate in water sports as well as normal persons. The exercises of swimming helped them to regain the sense of coördination and balance necessary for walking. This treatment was further supplemented by sun baths. The results are not miraculous but are definitely encouraging.

Warm Springs has something of definite value for persons handicapped by infantile paralysis.

Observations Regarding Diphtheria Immunity—The report of the work given in this paper indicates that immunity to diphtheria may not rest solely on an antitoxic basis. A group of persons originally Schick tested were immunized. Seven months later they were tested again and found negative. After 14 months, this group was still Schick negative but Kellogg positive. (The Kellogg test is a means of determining almost quantitatively the presence or absence of a protective amount of antitoxin in the blood. A positive test shows that there is no antitoxin present or an exceedingly small amount.)

The authors believe then that certain persons may be considered latently immune because they very quickly develop antitoxin if given a secondary stimulus such as a single dose of toxin-antitoxin or even such a slight stimulus as the Schick test. They state further that there is an essential difference in the permanence of free antitoxin in the blood of those artificially immunized and those naturally immune. The latter always have free antitoxin in their blood while the former do not. This indicates "that natural immunity may not exist solely by reason of exposure to infection, but may be, in part at least, a physiologic occurrence."—Wilfred H. Kellogg, M.D., and Ida May Stevens, M.A., *J. A. M. A.*, July 23, 1927.

Rickets—A Brief Summary With Reflections—True to his title, the author gives briefly the theories of various workers as to the cause of rickets. He does not believe that the human infant develops a less severe form of this disease when fed on human milk than on cow's milk because of an increased antirachitic factor in human milk. Instead he considers it probable that it is "because of a peculiar chemical and physical constitution of human milk," which is necessary for the proper functioning of the various organs of the infant.

He suggests that vitamins do not play a primary rôle in the development of rickets because, if they did, human milk would be richer in the antirachitic factor than it is. Moreover, diseases definitely known to be caused by vitamin deficiency are very rare in infants, while rickets is common.

Evidence seems to indicate that the fundamental or primary cause of rickets is inadequate exposure of the infants to that portion of sunlight known as the actinic rays or their equivalent.

To prevent rickets, the infant should be treated early with cod liver oil or exposed to sunlight.—Henry J. Gerstenberger, M.D., *J. A. M. A.*, July 23, 1927.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN *

To Give and to Get at Cincinnati—The Telling the World Clan will be at Cincinnati October 17–21 in goodly numbers. The clever poster and car-card designers; the expert mixers of type and brains; the facile press writers—and all the rest.

They will have pockets or hand-bags full of their best work; they will bring extra copies for distribution at Education and Publicity Headquarters; they will be ready to tell how they carried out ideas successfully and how they failed—at breakfast, luncheon and dinner, and in between. They will be bubbling with questions and eager to hear what you have done and what you have learned.

Throughout the day you will find some of them at Education and Publicity Headquarters—ready to give and to get.

Come early and stay late. Every one who comes to Cincinnati means more to give and to get for every one.

An Exhibit of Publicity Gems—A permanent exhibit of selected publicity and educational material was authorized by the Public Health Education Section several years ago. No one has had time to prepare it. The question of whether it is worth while to attempt such an exhibit will be discussed at the Section business meeting at Cincinnati.

Where Legislators Pass—"One side of the kiosk that stands in the Capitol grounds at Richmond is used by the State Department of Health to display posters relating to its purposes and activities. We are now showing posters sent in by the hygiene classes of the various colleges." The instructions to artists include: "Particular care should be taken to stick to the point when health is the subject of the poster-building, or else the point may be entirely missed; it is not at all infrequent to see a poster labelled 'Health' but important mainly from a moral, or civic, or esthetic point of view. Moreover, the subject chosen may be when read one way entirely proper but read another way the exact opposite, or even entirely erroneous. Let me illustrate this: 'An apple a day' is not a bad slogan to adopt. Apples have high nutritive and corrective value as food, but to say that 'An apple a day keeps the doctor away' conveys the wrong idea entirely. With health authorities everywhere trying to educate the public to use sanitation and personal hygiene as means of safeguarding health and prolonging life, this slogan is particularly misleading."—Bureau of Child Welfare, Virginia Board of Health.

Anything About Diphtheria, Please—Good phrases; good sentences; good paragraphs; good leaflets; good arguments; good newspaper stories; good accounts of meetings, attendance at clinics, etc.; good slides; anything good that you or anyone in your city or state has used against diphtheria or for immunization is most earnestly requested in preparation for a session of the Public Health Education Section at Cincinnati in October. Kindly send samples or information to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

A Village Uses Graphic Methods—"A public health nurse of a village planned to celebrate Child Health Week by having a window demonstration, child health examinations and a health parade.

"The window demonstration which was labelled 'Sunshine for Babies' gave an excellent impression of the value of sunlight for children and was written up in the village papers. At the 2-day clinic 18 patients attended and were examined by local physicians.

"Thus far this nurse's program met with no serious difficulties but when she called a meeting to make plans for the parade none of the prominent local women responded to the invitation. Undaunted, the nurse enlisted the aid of the school teachers and held the parade which consisted of a college boys' band, boy scouts, a milk float, children dressed as vegetables indi-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York City.

cating the need for these articles in the diet, and a baby welfare float showing the work carried on in the local health center."—*Health News*, Albany.

Can We Do as Rome Does?—"Every evening in some one of the city's many squares the people can look at pictures that show them how streets may be kept clean and flies and mosquitoes prevented; how milk can be kept sweet in hot weather and how the baby should be fed. In addition to this utilitarian instruction, the citizens of Rome (Italy), are incited to the love of beauty by pictures of the most beautiful cities of the world, their parks, streets, and buildings. The educational effects of this systematic instruction have been amazing, and the writer of this brief notice returned after some weeks in Rome to urge the same methods of education in Philadelphia." In Philadelphia "lantern slides of contrasting view of streets, clean and dirty and of parks littered as they are, and clean as they should and can be, have been shown for a month to the large audiences which gather every evening to listen to the open-air concerts of the municipal bands. The lantern slides are but tentative and to interest the audiences until the committee in charge shall have raised enough money to produce the more expensive moving pictures. This money is now in sight, for the *Public Ledger*, whose owners have the vision to see the possibilities in this form of public education, has offered to finance the whole plan as worked out in Rome, and also in Paris and Madrid. . . . The Departments of Health and Public Welfare will soon have films of their work to display and by these easy stages the committee will rise to visual instruction in pure beauty."—*Civic Comment*, Sept. 1, 1927.

How the Ten Best Were Selected—Of 150 samples of tuberculosis sanatoria instruction books issued to patients the "ten best" were selected by staff members of the National Tuberculosis Association on the following basis: "A publicity specialist chose from the entire lot 40 which to him seemed the best from the standpoints of typography and general attractiveness. An editor, judging these 40 from the standpoint of literary style, eliminated 10. A tuberculosis workers, viewing them from the standpoint of the possible psychological effect on the patient eliminated 10 more. A physician selected from the remaining 20, the 10 which seemed best from the standpoint of medical and health teaching." Dr. H. E. Kleinschmidt, National Tuberculosis Association, 370 Seventh Ave., New York, would welcome suggestions as to how a "more equable selection might be made." Four of the 10 came from Montefiore Country Sanatorium, Bedford Hills, N. Y., being published by the Tuberculosis Sanatorium Conference of Metropolitan New York (printed by the New York Tuberculosis and Health Association, 244 Madison Ave.); Vermont Sanatorium, Pittsford, Vt.; Devitt's Camp, Allenwood, Pa.; Albany County Tuberculosis Association, Albany, N. Y. The first of these, entitled "Getting the Most Out of Your Cure," was much the best of the four—as to type, color of paper and typographical arrangement. Of course the best appearing among the 150 may have been eliminated because of its literary style, possible psychological effect, or medical and health teaching. We wish that another test be made with each of the four specialists making their own selection of the 10 "best." (We expect to have the selected specimens with the detailed comment of the judges on display at Cincinnati.)

Dr. Earp Says That They Do Study Publicity and Education Methods—"I note your comment (Public Health Workers Do Not Study Publicity and Educational Methods, *American Journal of Public Health*, page 879, August, 1927) on the Johns Hopkins catalogue, and I feel it is up to me as a graduate to let you know that publicity methods were discussed in my time (not long ago—I graduated last year) under the general subject of public health administration. One of the things I best remember in Dr. Freeman's lectures was a trick that he played on the class with a poster. This was exhibited in one meeting and about a week later we were asked to describe it. You would be surprised how few of us had any idea what it was about!

"Then Dr. Howell in his lectures on personal hygiene discussed popular education though I confess with a view to the matter rather than the manner of its presentation. The latter, however, could not entirely escape notice.

"Frankly I do not think publicity has any more right to a chair in a public health school than hygiene has in a school of journalism. But I would not be without your section in the JOURNAL for anything!"—Rosslyn Earp, D.P.H., Antioch College, Yellow Springs, Ohio.

Another correspondent writes: "It is quite

true that the catalogue of the school contains no reference to courses on 'publicity.' In regard to 'education' I am at a loss to know just what is meant. The whole program of the school is one of education for the public health officer and some effort is made at instructing the public through public lectures in hygiene. To some extent the subjects of publicity and educational methods are discussed in the courses in personal hygiene as well as in the one on public health administration where such topics would naturally be considered, but they give no course especially devoted to those topics. The concluding paragraph of the statement seems to be in bad taste, coming from one who evidently knows nothing of the work of the school."

Bring **Your Prize Poster to Cincinnati**—Sponsors of every health poster contest held within the past 12 months are *invited to send their first prize poster* to Cincinnati for exhibition October 17–21, 1927. Ship *prepaid* to or deliver to Prize Poster Exhibit, Education and Publicity Headquarters, Gibson Hotel, Cincinnati, O.

Attach to the front of the poster the name or title and date of the contest, and the name and address of the organization conducting it.

Please *mail in advance* to the same address a full copy (or better, two copies) of the announcement and conditions of your contest.

If you wish your poster shipped back to you at the end of the convention send a letter to that effect.

"**Food Facts vs. Food Fakers**"—"A few years ago, the American newspapers practically eliminated the quack doctor and patent medicine faker. A good many of these are now staging a come-back under the guise of beauty experts, health experts, reducing experts and diet specialists. . . . Their doctrines run from cure for cancer and corns to protection against old age and fat. Their formula is usually a trick diet and purchase of a book. Most of these faddists unfortunately decry bread, this being their ballyhoo principally because bread has been man's universal food through the ages. Ample authoritative evidence can be furnished that bread has its place in the diet from childhood to old age, through sickness and in health. . . . Many well informed doctors and groups are disseminating valuable health information through the newspapers, and this is adding to the health and happiness of the people. The object of this advertisement is to ask American newspaper publishers to investigate the authenticity, authority and reputation of their medical syndicate writers, just as they verify their news items and vouch for their advertisements."—A full page advertisement in *Editor and Publisher* from American Bakers Association, 1135 Fullerton Ave., Chicago, Ill. Few editors will fail to welcome courteously presented doubts regarding the ethical and practical nature of health material appearing in their newspapers.

At 40 Fairs in Illinois—"The department of public health is participating in a special state educational program arranged for reaching people at more than 40 district and local fairs in Illinois. Equipped with motion picture projectors, films, special agricultural and dairy products prepared for exhibition, posters, literature, etc., the five traveling units are prepared to pitch tents upon arrival at the fair grounds and open a first class exposition which portrays in a very practical and illuminating way the various activities in which the state government engages. A staff from the health department do superficial examinations of adults who wish them and conduct well baby conferences. . . . A total of 29 better baby conferences have been scheduled to take place at as many different fairs under the supervision of the state department of public health. Close to 10,000 babies will be examined at these conferences. An especial effort will be made to provide an adequate medical consultation service at each point so that mothers who bring their children for examination may discuss their problems freely with experienced pediatricians."—*Illinois Health News*, Aug., 1927.

COÖPERATING GROUPS

"The Syracuse branch of the Flower, Plant and Fruit Guild has placed hanging baskets of flowers in the upper and lower corridors of the Syracuse Free Dispensary. The Guild has also furnished window boxes of flowers for the Tuberculosis Clinic at the Free Dispensary. The window boxes were given through the Onondaga Valley Garden Club. Window boxes will be furnished the North State Street Clinic, the Park Avenue Health Station and the Tully Street Center. The guild is coöperating with the Department of Health in an effort to make the public health clinics of the city as attractive as possible."—*Better Health*, Syracuse.

The members of the National Congress of

Parents and Teachers receive every month "Child Health" a department in the *Child Welfare Magazine* conducted by the American Child Health Association.

EDUCATIONAL MATERIAL

The dangers of 1627 (wolves and Indians) are contrasted with the dangers of 1927 in an 8-page safety folder: Is Your Child Safe Today? Metropolitan Life Insurance Co.

Good for speakers, group leaders and those who wish to understand the background is Smallpox and Vaccination, by J. J. Heagerty. Dominion Department of Health, Ottawa, Can., 1924. 28-page, book size pamphlet; popular; illustrated; most readable material we have seen on the subject. Possibly some of the copy on pages 7–9 might have been made the opening paragraphs.

A group of attractive 6-page folders have been issued by the Health Conservation Department of the Pilot Life Insurance Co., Greensboro, N. C.: The Teeth, Heart Disease, A Thing of the Past (diphtheria, which "should be as much out of date as the ox-drawn wagon"), Constipation, and Too Fat? Of the 6 pages in each folder 3 or 4 only are given to text. They are simple in form, and appear to be sound — although this department cannot speak with authority. *Free.*

Pleasing in appearance is the 1927 calendar (just received) of the National Safety Council, 108 East Ohio St., Chicago, Ill. Colored sketches on each of the 12 pages illustrate single ideas effectively. The one entitled "From Babyhood On, An Annual Health Examination" shows how attractively the idea can be presented. The back of each monthly sheet is devoted to a health topic: Annual Physical Examination, Colds, etc. My guess is that less copy and larger type would mean more readers. We wish also that one or more of the elaborate borders and decorations might be omitted.

Revised editions of the following have been issued by the Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y.: The Conquest of Typhoid Fever, Feeding Your Baby, Good Teeth, The Health of Workers, Train Ticket to No-Diphtheria Town, Tuberculosis, Measles—A Message of Hope.

Address by Hon. Elihu Root. State Charities Aid Assn., 105 East 22d St., New York, N. Y. *Free.* Quotable arguments for voluntary agencies to supplement the official groups.

A. M. A. Catalogue. American Medical Association, 535 North Dearborn St., Chicago, Ill., 1927. Price-list of professional and popular educational publications, etc.

The Family Food Supply. Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y., 1927. 16 pages. "Diet and marketing helps for the housewife."

The Mind of the Child. Metropolitan Life Insurance Co., New York, N. Y., 12 pages. Largely about the problem child.

REPORTING TO THE PUBLIC

"To give to interested persons some information concerning the organization of the Milwaukee Health Department and to describe the various types of services which the health department offers to the Milwaukee public" is the purpose of a 44-page pamphlet. It is not a report but a picture of the organization and its functions. Typographically it is much better than the average department publication. It lacks both index and table of contents, and unfortunately it is not dated.

The job of They're Pioneers (Rutherford County Child Health Demonstration Committee, Murfreesboro, Tenn.) seems to be to explain the demonstration, to give recognition to all who have helped, and to present in readable fashion quite a little public health information. Four flag-staffs are effective in using the appraisal scoring to indicate progress. Well done in 20 pages of text and pictures.

Notable for the illustrated chart of "Milestones," similar to that of the A.P.H.A., is the *Annual Report, 1926–1927,* Visiting Nurse Association of Somerset Hills, 10 Olcott Ave., Bernardsville, N. J. There is no "Report of the President" or "Report of the Superintendent," but there are 4 readable pages of "General Information" and "About Our Work." Possibly more readers would have looked at "Milestones" if placed between pages 2 and 3.

Practically a descriptive report is "The New York State Program in Venereal Disease Control," by Albert Pfeiffer. New York State Dept. of Health. Seven of the 18 pages of text and diagrams are devoted to Educational Measures (Lectures, Publicity, Circular Letters, Radio, Pamphlets, Daily Press). Worth getting for practical details. Suggestion for next issue of the pamphlet: add table of contents on the blank inside cover page.

TITLES

Don't Let the Mosquitos Bite. Oregon State Board of Health press release. Aug. 2, 1927.

Hairs That Fall by the Wayside. *Popular Health*. Aug., 1927. Baldness.

The Murderer of Babies. *Jamaica Pub. Health*, Kingston. June, 1927. "Lack of home sanitation."

Sleep for the Sleepless. *Popular Health*. Aug., 1927.

Sunshine Makes Healthshine. *Chicago's Health*, Chicago Department of Health. Aug. 16, 1927. Effective use of cartoons and statistics in answer to a recent statement "in the press to the effect that since women have been wearing less clothing the resulting exposure to the sunshine has increased the incidence of tuberculosis in females."

MOTION PICTURES

The Associated Press quoted from the annual report of the British Empire Cancer Campaign an account of the use of motion pictures to tell the story of the expanding cancer cell. Pictures were taken at intervals of 10 seconds, 30 seconds or one a minute. In order to show the result on the screen the film must be speeded up as much as 960 times.

Free motion pictures on safety, sanitation, fire protection, first aid and health are supplied by the Y. M. C. A. Motion Picture Bureau, 120 West 41st St., New York, N. Y. 1927–1928 catalogue is ready. *Free*. Some of the pictures are put out by manufacturers of commercial products. In making selections from this and all other sources consideration should be given to the standards for desirable motion pictures developed by the National Health Council. Institutions having use for non-health pictures may secure a wide variety from the Y. M. C. A. Bureau.

"The newest dental health film is 'Clara Cleans Her Teeth.' It is splendidly staged and interesting but, in my opinion, is most misleading from an educational standpoint. Almost the entire emphasis is on the tooth brush as a preventive of decay; of the two greatest preventive measures, diet and early dental care, we have nothing except, incidentally, a milk drinking scene. The impression is also left that a few visits to the dentist will change the most neglected, badly decayed teeth to a perfect set of teeth and we know this does not happen in real life. Dentists have been trying to find a short cut to dental health, but it has yet been discovered." — William R. Davis, director, Bureau of Mouth Hygiene, Mich. Dept. of Health.

POPULAR HEALTH ARTICLES

A Half-Seeing World. Editorial. *Saturday Evening Post*. Aug. 27, 1927. "The world is full of partially blind people." "Then, too, the lighting of our houses, schools and industries can be enormously improved."

Sit Well, Stand Well, Be Well. *Liberty*. Sept. 3, 1927. A page with brief text, and three pictures "posed under direction of the American Posture League."

RADIO

The June 17 broadcast by the New York State Dept. of Health on "Lindbergh, the Man" includes some of the material which can be worked over in various forms. Lindbergh, as an illustrative example, can be utilized for some time to come.

"Meeting Reverses and Disappointments" and "Mental Hazards of Middle Life"—radio talks by Mental Hygiene Committee of Penn. Charities Assn.

REGRETTABLE BUT TRUE

That in a 2-page mimeographed bulletin of a state health association 7 of the 15 paragraphs began with "We," and that "we" appeared 10 times in the 2 pages.

That a national health organ, urging the value of a certain report, gave the following inadequate information as to the price: "This report is available through . . . *at low cost*."

Short Story Contest Extended—*The Public Health Nurse*, 370 Seventh Ave., New York, N. Y., announces that the closing of the short story contest has been postponed until October 15, 1927.

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B., DR.P.H.

Slander and Venereal Disease—A physician employed by a steamship company said to a woman, "You cannot embark because you suffer from a contagious venereal disease." The woman's niece and other persons were present and heard the remark, which was made by the physician at the office of the steamship company in Porto Rico. The woman, an alien, sued the company for slander, alleging that the words were false and defamatory. For this and other causes she was awarded $4,900 damages, but this judgment was vacated on appeal by the U. S. Circuit Court of Appeals of the First Circuit.—N. Y. & Porto Rico S.S. Co. vs. Garcia, 16 Fed. (2d) 734. The case is abstracted in the *Journal of the American Medical Association* for August 13, 1927 (page 550).

An imputation of venereal disease gives good cause *per se* for an action of slander or libel. Certain communications are, however, privileged and the court decided that this particular instance was one of them. "An utterance, though false, may be thus privileged, and if made in the honest belief that it is true and from no malicious motive, is not actionable." In this case, the physician was merely performing what was his duty, in view of a business relation between him and the other party. The mere fact that others not legally interested were accidentally present and overheard the remarks does not remove the condition of privilege. Malice could not be conclusively presumed under such conditions. Malice might, of course, be shown, but in this case it was not and there was no legal inference of its presence.

The application of libel and slander to public health work is discussed at length in this department in the JOURNAL for November, 1926.

Should the State Distribute Venereal Prophylactics?—A lively discussion as to the function of the state in supplying free prophylactics to prevent syphilis has been going on in the sometime Hub of the Universe. Dr. George H. Bigelow, State Commissioner of Health of Massachusetts, recently wrote to the *Independent* and raised the question as to whether such distribution of a prophylactic was proper. Dr. W. P. Bowers, editor of the esteemed *Boston Medical and Surgical Journal*, vigorously opines in an editorial in the issue of August 18, 1927, that it is not. "If a man wants to take a chance with syphilis let him buy his own calomel ointment," writes this editor, "he will be more apt to use it if he pays for it." Dr. Bowers suggests that if the state wants to attack the problem of venereal disease with any efficiency, it should be by more extensive prophylactic education and more radical control of the diseased person.

In a letter to the editor, printed in the same number of that journal, Dr. Bigelow replies to the editorial and states that the control of venereal diseases may be classed under four headings, as follows: (1) control of cases by reporting, maintaining under treatment until non-communicable at least, hospitalization, etc.; (2) control of the sources of infection by bringing them under treatment, police supervision and the like; (3) control of the mode of spread through education as to continence, etc.; and (4) individual prophylaxis. "Under the first three headings most official health organizations are at least going through some sort of motions," he says, "but under the fourth there is generally a blind spot." Dr. Bigelow further writes that if the reason for doubt as to an effective prophylaxis against the venereal diseases is removed, he hesitates to think of the absurdities to which "some of us health officers will go to rationalize a comfortable inactivity."

This matter will surely have to be referred to that infallible fountain head of all authority on venereal diseases, the American Social Hygiene Association.

School Ventilation Laws—Provisions which ought to be included in a model ventilation law for schools are presented by Thomas J. Duffield, Secretary of the New York State Commission on Ventilation, in the June, 1927, issue of the *Journal of the American Society of Heating and*

Ventilating Engineers. Among the provisions suggested are the following: Plans for construction of school buildings shall show and fully describe heating and ventilation and such plans shall be approved by some one ["the legally constituted authority," whoever that is]. Every school building to be constructed, reconstructed, or enlarged shall be provided with a heating system sufficient to heat all parts of the building, minimum temperatures being given for various parts, including 68° F. for occupied rooms; all classrooms shall have at least 15 square feet of floor space per pupil and be provided with a system of ventilation to avoid unpleasant odors and keep temperature at 68° [means of accomplishment of this are suggested]. Every schoolroom shall be provided with at least one thermometer, accurate and properly located. An "approved" system of ventilation shall be maintained in operation whenever school is in session [query, approved by whom?].

The provisions as set forth above are somewhat condensed and anyone interested should read these generally excellent suggestions in full. Mr. Duffield cryptically remarks: "In those states which have enacted legislation laws regulating the ventilation of school building, such laws, or the regulations adopted in conformity with them, generally reflect the best practice in this art at the time of their adoption. However, the scope of such laws and regulations has usually been limited either specifically in the original laws or regulations, or in their application, with the result that in the smaller school buildings in villages and rural districts, ventilation has been seriously neglected." He also states that there is a need for revision of much existing school ventilation legislation, and offers these recommendations from the New York State Commission for criticism and suggestions.

State Regulation of Bathing Places—Twenty-one states now have regulations governing the sanitation of public bathing places, according to a compilation which appears in the *Journal of the American Association for Promoting Hygiene and Public Baths* for April, 1927 (page 63). This issue also reproduces the California rules adopted in August, 1926, the Kansas swimming pool registration form, and South Dakota regulations of 1926.

The outstanding event of progress in swimming pool regulation is declared editorially by this journal to be the 1926 report of the Joint Committee on Bathing Places of the A.P.H.A. and the Conference of State Sanitary Engineers. In an article entitled "State Regulation of Bathing Places" (page 30), Arthur Morton Crane suggests that the paramount duty of all controlling authorities is to specify the desired result, rather than the means thereto, and therefore that two items are necessary for control of bathing places. One is comprised of certain standards of purity for the protection of health, with a penalty; the other is made up of directions and recommendations as to how the specifications may be attained, without any penalty.

The viewpoint of the practicing physician on swimming pool sanitation is given in an article entitled "Paranasal Sinus Infection and Swimming" in the *Journal of the American Medical Association* for August 13, 1927. The author, Dr. F. E. Hasty, an otolaryngologist, states that while public health officials and sanitarians have made tremendous efforts to make swimming pools safe for swimmers, their efforts have unfortunately not resulted in the desired effect. He raises the question as to whether some patients should not be warned not to use swimming pools.

Tuberculosis and Compensation—Where an employe works under such conditions that he inhales particles of sand, so that his resistance to tuberculosis is broken down and tuberculosis results, compensation may be awarded under the laws of Connecticut, Mesite vs. International Silver Co., 134 Atl. 264; but where tuberculosis in a dry grinder could not be traced to a definite occurrence which could be located in point of time, and working conditions were good, it cannot be held that the occupation accelerated or caused the disease and no award can be made, Madore vs. New Departure Mfg. Co., 134 Atl. 259 (Conn.). A claim filed in May, 1925, for tuberculosis alleged to have been induced by working conditions undergone in April, 1922, is not compensable under Ohio law, which requires all claims to be made within two years after the injury or death. Campbell vs. Industrial Commission, 153 N. E. 276.

How Laws Prevent Occupational Diseases—Minimum standards of safety in industry could not be established without the enactment of laws, according to John Roach, Deputy Commissioner of Labor of New Jersey, whose address on the extent to which labor laws prevent diseases of occupation is reported in the *Monthly Labor Review* of the U. S. Bureau of

Labor Statistics for August, 1927. Only when such laws represent the will of the community, however, and safeguard the best interests of the people, and definitely establish the legal rights and responsibilities of the citizens will they become effective in promoting social welfare. The effect of laws requiring safeguards such as exhaust systems for the removal of dust and fumes has been to remove processes involving such hazards from their former dark and insanitary surroundings to well-lighted workrooms, with the result that a better product is obtained, the health of the workers is conserved, and their comfort is greatly increased.

Ecuador has recently passed a new law on industrial hygiene, according to a news release of the U. S. Children's Bureau. This act requires all proprietors of workshops to furnish safe and sanitary surroundings for their workers. The law also forbids the employment of women and children under the age of 18 years in work where white lead or other poisonous coloring substances are used, in the manufacture and handling of explosives or inflammable materials, and in heavy manual labor. Women workers are to be given 4 weeks' leave before childbirth and 6 weeks' after childbirth, during which period their employers shall pay 50 per cent of their salary. Employers are not permitted to dismiss pregnant women without legal reason.

Prohibition of Oleomargarine Held Void—The manufacture and sale of any product to be used as a substitute for butter, and made by combining with milk or milk fats any fat, oil, or oleaginous substance, was prohibited in Wisconsin by a law passed in 1925. This act has recently been held unconstitutional by the Supreme Court of that state on the grounds that the law was justified neither for the protection of public health nor the prevention of fraud, J. F. Jelke Co. v. Emery, 214 N. W. 369. "This law," said the court, "prohibits the carrying on of a legitimate, profitable industry and the sale of a healthful, nutritious food." Inasmuch as oleomargarine is practically devoid of vitamins, this legal dictum seems somewhat exaggerated. "The public health," avers this court, "is not endangered by the manufacture and sale of oleomargarine, and certainly no question of morals is involved." According to McCollum (citing studies by Widmark), the use of margarine as a substitute for butter in Denmark is the cause of the prevalence of ophthalmia. "There is not the slightest evidence that the prohibition is justified in order to prevent fraud," continues the court. Butter, as a milk product, is one of the most valuable of foods. Oleomargarine is of no value for any nutritive purpose. If passing off a substance deficient in vitamins as a proper substitute for a food rich in them is not a fraud, what is?

Sound Advice on Nuisances—Radio Health Talk No. 274 of the New York State Department of Health, released on August 27, 1927, is entitled "Nuisances, Dangerous and Otherwise." This talk, by Dr. Paul B. Brooks, Deputy State Health Commissioner, outlines the modern conception of these pestiferous conditions usually dubbed nuisances. "It is hard to break away from tradition," says Dr. Brooks, "and some people still look upon the investigation of nuisance complaints as the most important function of a health officer—at least when they are the complainants. From the standpoint of results, however, it is far more important for him to spend his time, for example, supervising the local milk supply, which is one of his numerous duties. An inadequately supervised milk supply in one city recently was responsible for over 4,000 cases of typhoid fever. All of the hog pens, rubbish piles and dead horses in New York State, singly or all combined in one big nuisance, could not do that much damage." This radio talk ought, like many from this source, to be broadcast nationally. If the public would follow its sound advice, health officials might be troubled less by the ubiquitous nuisance complaint. Copies of the release may be obtained from B. R. Rickards, State Department of Health, Albany, N. Y.

Appointment of Acting Health Officers—The Public Health Law of New York contains the somewhat unique provision (section 21) that local health officers may appoint acting health officers to serve in their places during temporary absence or incapacity. Only a competent physician may be so appointed and for a period not to exceed 3 months. The consent of the board of health or other regular appointing authority must also be secured, and the name of the acting health officer must be reported immediately to the State Department of Health. In outlining the procedure under the law, *Health News* of New York for August 8, 1927, suggests that "an inclination to by-pass any of the legal technicalities should not be encouraged." It is further truly stated that serious

complications might arise if an acting health officer were called to account for an official act and it was found that he had no official standing because he had not been legally appointed.

Ticks and the Law—Public spirited (?) residents of Pine Grove, Mont., were reported recently as seeking an injunction to prevent the establishment in their community of a laboratory for research on Rocky Mountain spotted fever. The members of the State Board of Health, which planned to maintain the laboratory, were made defendants. At a hearing held July 29, the residents expressed fears that the ticks held captive for research purposes might escape and attack them. The State Health Officer, Dr. William F. Cogswell, assured the court that there would be no such possibility and testified as to the travel speed and leaping ability of the ticks. The injunction was denied.

Kellogg's ALL-BRAN
RELIEVES
CONSTIPATION!

CONFERENCES

October 3–6, American National Red Cross, Washington, D. C.

October 3–8, Playground and Recreation Assn. of America, Memphis, Tenn.

October 10, Women's Foundation for Health, New York, N. Y.

October 10–12, American Occupational Therapy Assn., Minneapolis, Minn.

October 10–12, Regional Conference on Social Hygiene, Kansas City, Mo.

October 10–14, American Hospital Assn., Minneapolis, Minn.

October 11–12, Delaware State Medical Society, Farnhurst, Del.

October 13–15, National Committee for the Prevention of Blindness, Chicago, Ill.

October 13–15, Missouri Conference on Water Purification, Sedalia, Mo.

October 17, Conference of State Sanitary Engineers (at A.P.H.A. Conference), Cincinnati, O.

October 17–21, American Public Health Association, Cincinnati, O.

October 23–25, Kentucky Conference of Social Work, Louisville, Ky.

October 24–28, American Dental Association, Detroit, Mich.

The new fifth edition of

HEALTH BOOKS

A Bibliography on Public Health and Allied Topics

IS READY

Over 100 new titles

Send for your copy at once

Book Service
AMERICAN PUBLIC HEALTH ASSOCIATION

We supply all books of all publishers

Harvard School of Public Health

Opened September 26, 1927

THE HARVARD SCHOOL OF PUBLIC HEALTH offers courses and opportunities to fit students for administrative, teaching, field, or laboratory positions in public health. To this end, lectures, laboratory work, hospital exercises, field surveys, and other forms of instruction are offered by members of the Faculty and by special instructors actively engaged in public health work. Coöperation is maintained with federal, state, and local health departments, and with hospital and other agencies. Favorable opportunity is given to those who desire to contribute to knowledge through laboratory research or field investigation.

Intensive courses, each occupying one month, are offered in Child Hygiene, Hospital Administration, Mental Hygiene, and Industrial Hygiene. These may be taken singly. As many of the courses are given every morning or every afternoon for one or two months, there are unusual opportunities for health officers to take blocks of study for one or two months.

For information apply to the Secretary,

55 Van Dyke Street Boston, Mass.

ADRENALIN

[The Parke, Davis & Co. Brand of Epinephrin, N. N. R.]

The First Hormone

OVER a quarter of a century ago Adrenalin was discovered in the House of Parke, Davis & Company, and shortly afterward Solution Adrenalin Chloride was introduced to the medical profession. During the years that followed, when Adrenalin occupied the field alone, there was developed the greater part of the laboratory research and clinical experience on which the present knowledge of the chemistry, physiology and therapy of epinephrin is based.

These impressive facts have taught clinicians the wisdom of insisting on getting the original product, now that there are many other epinephrin preparations on the market. The one word "Adrenalin" on orders or prescriptions will secure the genuine Solution Adrenalin Chloride, P. D. & Co. No other preparation of epinephrin can be properly called Adrenalin.

Write for the new edition of our booklet, "Adrenalin in Medicine"

PARKE, DAVIS & COMPANY
DETROIT, MICHIGAN

ADRENALIN (EPINEPHRIN, P. D. & CO.) IS INCLUDED IN N. N. R. BY THE COUNCIL ON CHEMISTRY AND PHARMACY OF THE AMERICAN MEDICAL ASSOCIATION

FORMA-GERMKILL FORMALDEHYDE FUMIGATOR

Especially for
HEALTH DEPARTMENTS

Convenient to operate
Effective and Economical

Made in six different capacities for various sized rooms.

Sample Fumigator for personal test sent upon request

CENTRAL CITY CHEMICAL CO.
Incorporated 1912
4250-56 N. Crawford Ave., Chicago, Illinois